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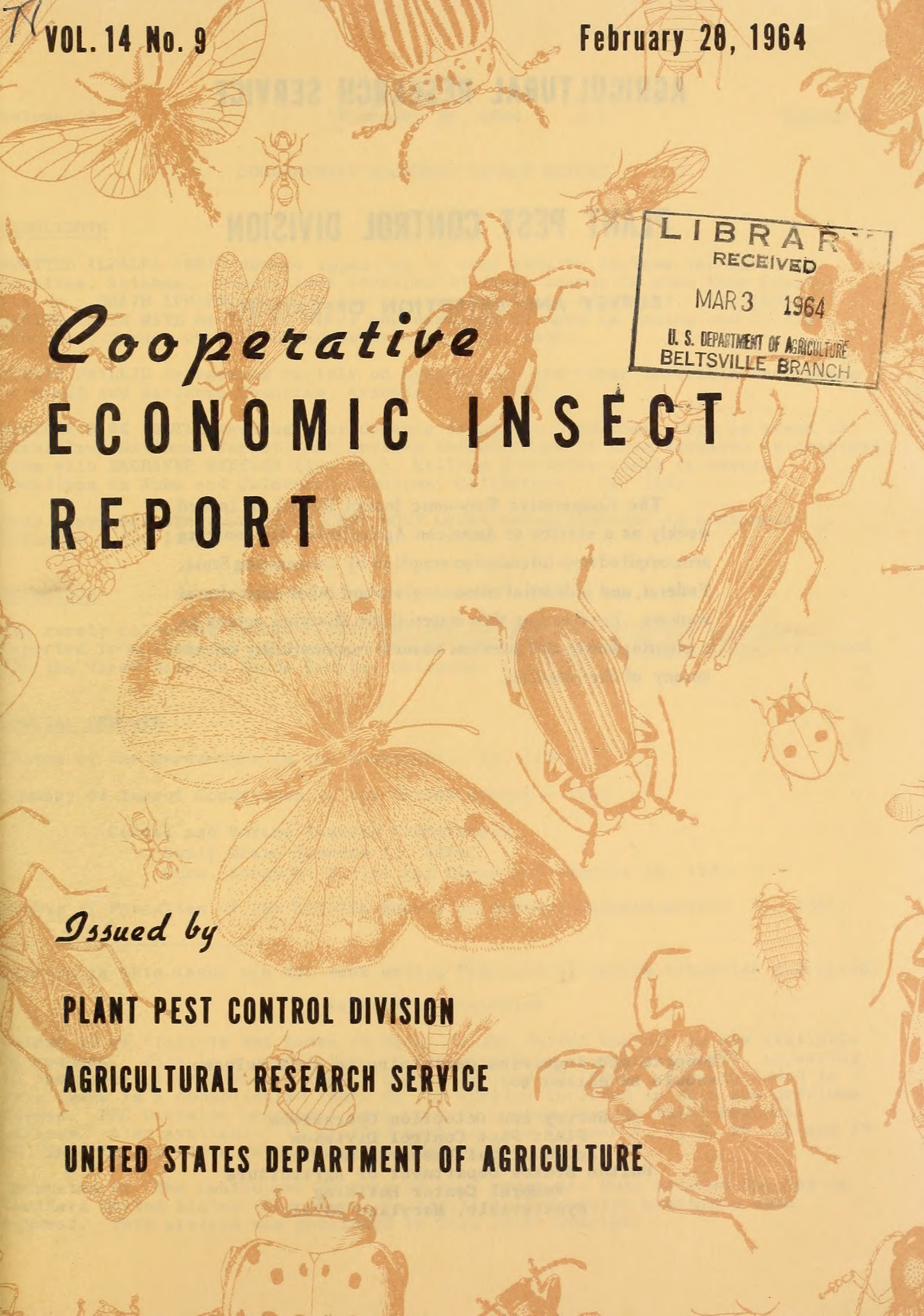

Cooperative
ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION

AGRICULTURAL RESEARCH SERVICE

UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Hyattsville, Maryland 20781

Volume 14 February 28, 1964 Number 9

COOPERATIVE ECONOMIC INSECT REPORT

HIGHLIGHTS

SPOTTED ALFALFA APHID damage appearing in some alfalfa in Yuma and Maricopa Counties, Arizona. Populations advanced to upper leaves in some Yuma County fields. GRAIN APHIDS continue low or noneconomic in Southwest. (p. 109). WINTER GRAIN MITE medium to heavy and damaging to oats in Denton and Collin Counties, Texas; over 6,000 acres treated. (p. 110).

POTATO PSYLLID increasing rapidly on Lycium spp. and other favorable weed hosts in Pinal and Maricopa Counties, Arizona. (p. 111).

WESTERN BARK BEETLE causing considerable damage to ponderosa pines in areas of Stanislaus National Forest, and spotted infestations of this species, in combination with ENGRAVER BEETLES (Ips sp.), killing ponderosa pines in several locations in Yuba and Calaveras Counties, California. (p. 112).

Many heavy infestations of CHICKEN BODY LOUSE being reported in northwest Arkansas. (p. 113).

DETECTION

Two rarely collected FLOWER FLIES, Psilota buccata and Volucella anastacia, reported from Florida. (p. 115). YELLOW SUGARCANE APHID (Sipha flava) reported for the first time in Woods County, Oklahoma. (p. 109).

SPECIAL REPORTS

Status of the Screw-worm in the Southwest. (p. 114).

Summary of Insect Conditions in the United States - 1963

Cereal and Forage Insects (continued).
  Small Grain Insects (p. 118).
  Corn, Sorghum, Millet and Sugarcane Insects (p. 124).

Survey of Parasites of the Alfalfa Weevil in Western Massachusetts. (p. 138).

Reports in this issue are for week ending February 21 unless otherwise indicated.

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Volume 13 of "Insects Not Known to Occur in the United States" is now available on request. This is a compilation of the separates, numbers 150-161, appearing in the Cooperative Economic Insect Report, Volume 13, 1963. Also included in this issue is a consolidated index of the species included in this and previous issues. PPC Division personnel will receive copies through their Regional Offices. Also available, in limited numbers, are Volumes 7, 8, 9, 10, 11 and 12 of "Insects Not Known to Occur in the United States."

Separates of "The Leafhopper Vectors of Corn Stunt and Some Related Species in Southern United States (Homoptera: Cicadellidae)" are also available upon request. This article was published in CEIR 14(8):105-106.

WEATHER OF THE WEEK ENDING FEBRUARY 24

A disturbance, centered over the northern portion of the Gulf of Mexico, produced rains over the eastern part of the southern Great Plains early in the week. New Orleans, La., received 1.15 inches on Monday, February 17. A front stretching from North Dakota to Lake Superior produced a scattering of light snow flurries over the northern Great Plains. Light rains fell in the Far Northwest. Mostly fair weather prevailed elsewhere.

The storm that had been centered over the Gulf of Mexico intensified and moved quickly up the Atlantic Seaboard. It produced rain and drizzle over the Southeastern States and heavy snow over much of the Northeast. By Wednesday, Harrisburg, Pennsylvania, was blanketed by about 20 inches of snow and snow continued to fall as the storm moved further up the coast.

By Wednesday evening, a new storm was gathering force in the Rocky Mountains. Winds gusted to 60 m.p.h. as the storm spread southward through the northern and central Rockies and adjacent Great Plains. Snow, mostly light flurries, fell over most of the northern two-thirds of the Country from the Rocky Mountains eastward on Wednesday and Thursday. A storm developed over southeastern New Mexico and moved eastward producing snow flurries from New Mexico eastward through Texas and drenching rains over parts of south Texas. Snow flurries were seen as far south as Houston and Galveston, Texas.

The coldest weather of the week came to the midsection of the Nation over the weekend as a mass of arctic air poured into the Dakotas and Minnesota from Canada. Snow and dust, blown by winds reaching 45 m.p.h. reduced visibilities to 1/4 mile at times in the Dakotas and Minnesota. Temperatures plunged to 16° below zero at several locations in North Dakota and at International Falls, Minnesota. Chicago, Illinois, registered 2° above zero and Fort Wayne 1° below zero on Saturday. By midday Sunday the leading edge of the cold outbreak extended from Texas to Lower Michigan and by Monday morning a new storm center was intensifying in southern Saskatchewan, ready to bring more subzero cold into the northern Rockies and Great Plains.

Temperatures for the week averaged above normal along the Pacific Ocean and along the Canadian Border from Washington to Lake Huron and below normal over the rest of the United States. Temperatures averaged more than 10° below normal over much of the southern Rocky Mountains and southern Great Plains. Temperature departures ranged from -12° at Lubbock, Texas, and Mobile, Alabama, to +12° at Havre, Montana.

Wide areas from California to the Great Lakes received no precipitation or only light sprinkles or snow flurries. A few scattered areas in Texas received more than 0.50 inch. Most of the area southeast of a line from Lake Charles, Louisiana, to southern New York received more than 0.50 inch. The heaviest precipitation, generally exceeding 2.00 inches, fell over southern Georgia and southern South Carolina. Two of the most generous weekly totals were 3.25 inches at Tallahassee, Florida, and 3.51 inches at Savannah, Georgia. (Summary supplied by U.S. Weather Bureau).

CEREAL AND FORAGE INSECTS

SPOTTED ALFALFA APHID (Therioaphis maculata) - ARIZONA - Damage appearing in some alfalfa in Yuma and Maricopa Counties. Populations advanced to upper leaves in some Yuma County fields. (Ariz. Coop. Sur.). OKLAHOMA - Only occasional specimens found in overwintering alfalfa in Choctaw County (southeast). (Okla. Coop. Sur.). KANSAS - None found on alfalfa in south central or southwest areas. (Peters).

PEA APHID (Acyrthosiphon pisum) - ARIZONA - Increasing in Yuma and Maricopa Counties; ranged 100-120 per 100 sweeps. (Ariz. Coop. Sur.). NEW MEXICO - Has been a minor problem on seedling alfalfa in Artesia area, Eddy County. Cold weather apparently major factor in preventing buildup. (N. M. Coop. Rpt.). OKLAHOMA - Light numbers noted in few fields of winter peas in northwest area; limited reproduction occurring. Checks in alfalfa in Choctaw (southeast), and in Wagoner and Muskogee Counties (east central), negative. (Okla. Coop. Sur.). KANSAS - None found in alfalfa in south central or southwest areas. (Peters).

LYGUS BUGS (Lygus spp.) - ARIZONA - Counts continue low in alfalfa in Yuma and Maricopa Counties. (Ariz. Coop. Sur.).

ARMY CUTWORM (Chorizagrotis auxiliaris) - OKLAHOMA - Counts in central and northwest counties ranged from only an occasional larva to counts of 0-2 per linear foot. Areas in Grant County which had economic infestations last season have not reached this level of infestation. (Okla. Coop. Sur.).

ALFALFA CATERPILLAR (Colias eurytheme) - ARIZONA - Larvae increasing in alfalfa in Yuma, Maricopa and Pinal Counties. Counts per 100 sweeps ranged 20-25 in Yuma County and 12-15 in Maricopa and Pinal Counties. (Ariz. Coop. Sur.). CALIFORNIA - Larvae light on alfalfa in Fresno and Coalinga, Fresno County. (Cal. Coop. Rpt.).

CLOVER LEAF WEEVIL (Hypera punctata) - CALIFORNIA - Larvae light on alfalfa leaves in Coalinga, Fresno County. (Cal. Coop. Rpt.).

A WEEVIL (Hypera brunneipennis) - ARIZONA - No increase noted in alfalfa in Yuma and Maricopa Counties. Cool weather continues to keep populations at noneconomic level. (Ariz. Coop. Sur.).

GREENBUG (Schizaphis graminum) - NEW MEXICO - Populations remain light in small grains in northern Eddy and Chaves Counties; ranged 12-15 per linear foot. (N. M. Coop. Rpt.). OKLAHOMA - Populations continue noneconomic throughout State. Averaged fewer than 10 per linear foot in all checks conducted; most counts fewer than 5 per linear foot. Negative in considerable number of fields surveyed. Surveys were made in Logan, Kingfisher, Blaine, Major, Alfalfa, Woods, Garfield, Grant, Tulsa, Wagoner, Mayes, Muskogee and Pittsburg Counties. (Okla. Coop. Sur.). KANSAS - None found south central and southwest areas. Dry conditions earlier in season kept wheat plants from making good growth and snow cover has been limited; consequently, conditions have not been favorable for overwintering. (Peters).

ENGLISH GRAIN APHID (Macrosiphum avenae) - OKLAHOMA - Infestations low in all central and northwest counties surveyed; all counts fewer than 10 per linear foot. (Okla. Coop. Sur.).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - OKLAHOMA - Counts negative in all fields checked in central and northwest areas. (Okla. Coop. Sur.).

YELLOW SUGARCANE APHID (Sipha flava) - OKLAHOMA - Light numbers noted in field of wheat checked in Woods County. This is a new county record. (Okla. Coop. Sur.).

WINTER GRAIN MITE (*Penthaleus major*) - TEXAS - Medium to heavy and damaging oats in Denton and Collin Counties; over 6,000 acres in area treated. (Turney). OKLAHOMA - Generally light, scattered infestations noted in Logan, Kingfisher and Grant Counties. (Okla. Coop. Sur.).

A CENTIPEDE (*Geophilomorpha* sp.) - CALIFORNIA - This pest and crane fly larvae (*Tipula* sp., not *simplex*) medium in barley field in Livermore, Alameda County. (Cal. Coop. Rpt.).

TEXAS LEAF-CUTTING ANT (*Atta texana*) - TEXAS - Light to heavy, widespread populations causing considerable concern to residents of Robertson County. (Smith).

A SCALE INSECT - TEXAS - Heavy, widespread populations of an undetermined species reported on St. Augustine grass lawns in Live Oak County. (Van Zandt).

FRUIT INSECTS

WOOLLY APPLE APHID (*Eriosoma lanigerum*) - ALABAMA - Additional survey and inspection of commercial apple orchards in Coosa County revealed very heavy infestations on roots in untreated orchards. No damage noted to root systems in 2 orchards receiving controls. (Sessions).

SHOT-HOLE BORER (*Scolytus rugulosus*) - MARYLAND - Severe in bark and wood of peach tree at Havre de Grace, Hardford County. (U. Md., Ent. Dept.).

A LONG-HORNED BEETLE - MARYLAND - Larvae of undetermined species infesting bark and wood of peach tree at Havre de Grace, Harford County. (U. Md., Ent. Dept.).

OBSCURE SCALE (*Chrysomphalus obscurus*) - TEXAS - Heavy on 300 pecan trees in 900-tree orchard in Comanche County. (Meisch).

HICKORY SHUCKWORM (*Laspeyresia caryana*) - ALABAMA - Numerous larvae, apparently reaching full growth, still being found in old pecan and hickory nut shucks under trees in central counties. Tramping by grazing cattle and personnel harvesting nuts, along with late fall plowing in some orchards, has reduced extremely high populations that existed during October and November 1963, to some extent. (McQueen).

LESSER MEALWORM (*Alphitobius diaperinus*) - CALIFORNIA - Adults heavy in bark of avocado in Riverside, Riverside County. (Cal. Coop. Rpt., Feb. 14).

CAMPHOR SCALE (*Pseudaonidia duplex*) - FLORIDA - Light on leaves of avocado at Orange City, Volusia County, February 5. This is a new Department of Plant Industry host record for this species. (Roberts).

Citrus Insect Situation in Florida - Mid-February - CITRUS RUST MITE (*Phyllocoptruta oleivora*) on leaves infested 58 percent of groves (norm 64 percent); 43 percent economic (norm 40 percent). Citrus rust mite on fruit infested 44 percent of groves (norm 51 percent); 24 percent economic (norm 31 percent). Leaf infestations are near normal level and fruit infestations are low. Recent increasing trend will continue. Highest districts are west, north and central. TEXAS CITRUS MITE (*Eutetranychus banksi*) infested 37 percent of groves (norm 19 percent); 13 percent economic (norm 5 percent). Population is above low February level of all prior years. Increase is expected but few infestations will become heavy. Highest districts are west and east. CITRUS RED MITE (*Panonychus citri*) infested 41 percent of groves (norm 56 percent); 20 percent economic (norm 28 percent). Statewide population below average and at low level but increasing. Highest districts are west, central and north. PURPLE SCALE (*Lepidosaphes beckii*) infested 73 percent of groves (norm 79 percent); 7 percent economic (norm 16 percent). Population near average; little change expected; infestation light in all districts. GLOVER SCALE (*L. gloverii*) infested 74 percent of groves (norm 24 percent); 12 percent economic (norm 1 percent). Population above average; slight increase expected. Highest districts east and south. CHAFF SCALE (Parlatoria pergandii) infested 95 percent of groves (norm 41 percent); 16 percent economic (norm 1 percent). Population above average; little change expected. Highest districts east, central and south. YELLOW SCALE (Aonidiella citrina) infested 41 percent of groves (norm 8 percent); 9 percent economic (norm 1 percent). Population above average; decrease expected. Highest districts south and central. BLACK SCALE (Saissetia oleae) infested 21 percent of groves (norm 17 percent); 5 percent economic (norm 5 percent). Population has dropped to normal low level; little change expected. All districts low. WHITEFLIES decreased but are still above normal abundance. (W. A. Simanton (Citrus Expt. Sta., Lake Alfred)).

COTTONY CUSHION SCALE (Icerya purchasi) - CALIFORNIA - Heavy on citrus locally in Spring Valley, San Diego County. (Cal. Coop. Rpt., Feb. 14).

CITRUS RUST MITE (Phyllocoptruta oleivora) - FLORIDA - Infested citrus in nurseries at several localities, but most severe at Dade City, Pasco County, where 10,000 plants generally infested (Williams, Feb. 14), and at Lake Jem, Lake County, where 100 plants severely and generally infested (Brown, Fatic; Feb. 12).

WESTERN FLOWER THRIPS (Frankliniella occidentalis) - CALIFORNIA - Medium to extremely heavy populations on tangerine fruit causing severe damage and scarring of fruit in northern portion of San Diego County. Some damage to navel and Valencia oranges also occurring. Most damage occurring to highly colored fruit. This damage unusual for this species. (Cal. Coop. Rpt.).

GRAPE PHYLLOXERA (Phylloxera vitifoliae) - CALIFORNIA - Heavy on roots of muscat grape in vineyard in Madera, Madera County. (Cal. Coop. Rpt., Feb. 14)

TRUCK CROP INSECTS

TOMATO FRUITWORM (Heliothis zea) - ARIZONA - Increases in larval numbers noted on lettuce in Yuma County; averaged 8-10 per 100 plants. (Ariz. Coop. Sur.).

VARIEGATED CUTWORM (Peridroma saucia) - CALIFORNIA - Light on sugar beets in Imperial, Imperial County. (Cal. Coop. Rpt.).

BEET ARMYWORM (Spodoptera exigua) - ARIZONA - Spotted infestations noted on lettuce in Maricopa and Pinal Counties. Counts per 100 plants average 5-7 and range 2-35. (Ariz. Coop. Sur.). CALIFORNIA - Populations of this species and Udea profundalis light on sugar beets in Firebaugh, Fresno County. (Cal. Coop. Rpt.).

CABBAGE LOOPER (Trichoplusia ni) - ARIZONA - Noneconomic numbers noted on lettuce in Maricopa, Pinal and Yuma Counties. (Ariz. Coop. Sur.).

GREEN PEACH APHID (Myzus persicae) - ARIZONA - Showing marked increases on lettuce in Yuma County and on lettuce and sugar beets in Maricopa County. (Ariz. Coop. Sur.). FLORIDA - General on potato at Homestead, Dade County, during January and February. (Wolfenbarger).

CABBAGE APHID (Brevicoryne brassicae) - CALIFORNIA - Adults medium on cabbage in Arlington, Riverside County. (Cal. Coop. Rpt.). GEORGIA - Light on cabbage in southern part of State. (Johnson).

POTATO PSYLLID (Paratrioza cockerelli) - ARIZONA - Increasing rapidly on Lycium spp. and other favorable weed hosts in Pinal and Maricopa Counties. (Ariz. Coop. Sur.).

THRIPS - IDAHO - Attacking cabbage in farm storage near Fruitland, Payette County. Evidence indicates cabbage infested in field and population continued in storage. Some adults and small colonies found in center of heads, with high population under outer leaves. (Scott).

A LEAF MINER FLY (Liriomyza sp.) - FLORIDA - Infesting leaves of potato at Homestead, Dade County. (Wolfenbarger).

TOBACCO INSECTS

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - GEORGIA - Light on tobacco in the plant bed throughout southern part of State. (Johnson).

COTTON INSECTS

A WEEVIL (Sternochetus oblongus) - FLORIDA - Single specimen found on open boll of wild cotton (Gossypium hirsutum) at bayside of Key Largo, Monroe County. (Creamer, Feb. 14).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

WESTERN PINE BEETLE (Dendroctonus brevicomis) - CALIFORNIA - Causing considerable damage to ponderosa pines in Hunter Creek, Knight Creek, Jenness Pack Station and Lyons Reservoir in Stanislaus National Forest. About 1,500 trees being killed in 4,000 acres of timber. Sanitation salvage being used to control beetles. (R. Bodine, USFS). Spotted infestions of this species, in combination with Ips sp., killing ponderosa pines in several locations in Yuba and Calaveras Counties. (R. Thompson, C. Wolf; CDF).

AN ENGRAVER BEETLE (Ips sp.) - CALIFORNIA - Severe outbreak killing over 60 ponderosa pines in 1-acre stand near Schmidt Ranch, Mendocino County. Controls underway. (L. Graff, USFS).

A BLASTOBASID MOTH (Holcocera iceryaeella) - CALIFORNIA - Larvae heavy in twigs of pines in Santa Maria, Santa Barbara County. (Cal. Coop. Rpt.).

A PINE APHID - CALIFORNIA - An undetermined species heavy on Monterey pine in 15-acre Christmas tree farm in Hacienda Heights, Los Angeles County. (County Farm Advisor).

PINE SCALES - CALIFORNIA - Phenacaspis pinifoliae and Aspidiotus californicus heavy on pine trees in the Forest Genetics Station, Placerville, El Dorado County. Populations of what is possibly Toumeyella pinicola, heavy on pines in a local park in Santa Maria, Santa Barbara County. (Cal. Coop. Rpt.).

A GALL MIDGE (Contarinia pseudotsugae) - CALIFORNIA - Infesting Douglas-fir trees in Jarbo Gap, Butte County. Trees were cut for Christmas trees, but about 100 found unsaleable on retail lot. (C. L. Wagner, USFS). Medium on Douglas-fir in Iverness, Marin County. (Cal. Coop. Rpt.).

A CERMABYCID BORER (Neoclytus conjunctus) - CALIFORNIA - Larvae heavy in oak twigs bark and trunks in Patterson, Stanislaus County. Pest causes much concern this time of year when firewood is stored in residences. (Cal. Coop. Rpt.).

TOBACCO BUDWORM (Heliothis virescens) - CALIFORNIA - Heavy on geranium plants in La Jolla, San Diego County. (Cal. Coop. Rpt., Feb. 14).

OMNIVOROUS LOOPER (Sabulodes caberata) - CALIFORNIA - Larvae heavy on Hedera sp. in Salinas, Monterey County. (Cal. Coop. Rpt.).

AZALEA LEAF MINER (Gracilaria azaleella) - CALIFORNIA - Larvae heavy and tying leaves of azalea in Palo Alto, San Mateo County. (Cal. Coop. Rpt.)

AN YPONOMEUTID MOTH (*Argyresthia* sp.) - CALIFORNIA - Medium populations damaging arborvitae plants in Santa Rosa, Sonoma County. (Cal. Coop. Rpt.).

CUTWORMS - ALABAMA - Undetermined species causing extensive damage to small azaleas in a Mobile nursery; small plants in peat beds in hothouses being cut off at ground level. (Seibels, Bolton).

A WEEVIL (*Brachyrhinus rugosostriatus*) - CALIFORNIA - Medium in roots of succulents in Santa Cruz, Santa Cruz County. (Cal. Coop. Rpt.).

CRESCENT-MARKED LILY APHID (*Neomyzus circumflexus*) - CALIFORNIA - Medium on *Lilium* sp. in San Francisco, San Francisco County. (Cal. Coop. Rpt.).

SAN JOSE SCALE (*Aspidiotus perniciosus*) - CALIFORNIA - Locally heavy on cherry trees in Dinuba, Tulare County. (Cal. Coop. Rpt., Feb. 14).

EUROPEAN FRUIT LECANIUM (*Lecanium corni* complex) - CALIFORNIA - Heavy locally on *Viburnum* spp. in Exeter, Tulare County. (Cal. Coop. Rpt., Feb. 14).

ARMORED SCALES - CALIFORNIA - *Diaspis boisduvalii* heavy on *Cattleya* sp. in orchid house in San Francisco, San Francisco County. (Cal. Coop. Rpt.). FLORIDA - *Phenacaspis cockerelli* general on leaves of English boxwood at Monticello, Jefferson County. (Miller, Feb. 11).

MEALYBUGS - CALIFORNIA - *Pseudococcus obscurus* nymphs medium on *Chamaecyparis lawsoniana* in Salinas, Monterey County. *Phenacoccus gossypii* medium on *Dracaena indivisa* stock in Oroville, Butte County. (Cal. Coop. Rpt.).

WHITEFLIES - CALIFORNIA - *Trialeurodes merlini*, in combination with *Diaspis manzanitae* (an armored scale), heavy on manzanita shrubs in Forest Genetics Stations, Placerville, El Dorado County. *Aleyrodes pruinosa* locally heavy on *Photinia arbutifolia* in Stockton, San Joaquin County. (Cal. Coop. Rpt.). All stages of *A. pruinosa* heavy on ceanothus in Santa Barbara, Santa Barbara County. *Aleuroplatus coronatus* heavy on California live oaks in Sonoma, Sonoma County. (Cal. Coop. Rpt., Feb. 14).

CHRYSANTHEMUM LEAF MINER (*Phytomyza atricornis*) - CALIFORNIA - Light on leaves of chrysanthemum in La Jolla, San Diego County. *Phytomyza* sp. light on cineraria plants in Salinas, Monterey County, and La Jolla. (Cal. Coop. Rpt.).

TWO-SPOTTED SPIDER MITE (*Tetranychus telarius*) - CALIFORNIA - Eggs, nymphs and adults heavy on gardenia in Salinas, Monterey County, and medium on *Prunus* sp. in Parlier, Fresno County. (Cal. Coop. Rpt.).

PRIVET MITE (*Brevipalus obovatus*) - CALIFORNIA - Eggs and adults heavy on privet leaves in Salinas, Monterey County. (Cal. Coop. Rpt.).

AN ERIOPHYID MITE (*Aceria aloinis*) - CALIFORNIA - Light on *Aloe spinosissima* flowers in Vista, San Diego County. (Cal. Coop. Rpt.).

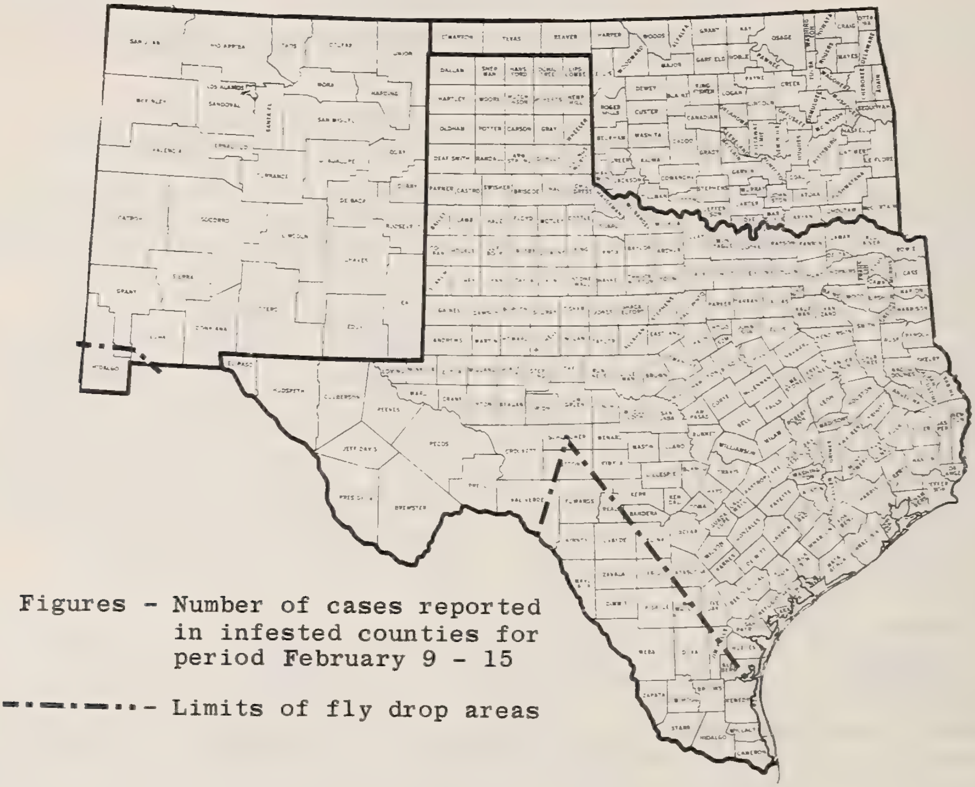
A TARSONEMID MITE (*Tarsonemus* sp.) - CALIFORNIA - Light on sadleria fern nursery stock in South San Francisco, San Mateo County; caused considerable damage to this fern species earlier in season. (Cal. Coop. Rpt.).

INSECTS AFFECTING MAN AND ANIMALS

CHICKEN BODY LOUSE (*Menacanthus stramineus*) - ARKANSAS - Many heavy infestations being reported in northwest area. (Ark. Ins. Sur.).

STATUS OF THE SCREW-WORM (Cochliomyia hominivorax) IN THE SOUTHWEST

No screw-worm identifications were made during the period February 9 - 15. With the exception of a doubtful case of preserved larvae submitted in January, it has been almost 2 months since a case of screw-worm has been determined. Collection of nonscrew-worm larvae in TEXAS continues good. Specimens were submitted from 37 cases of myiasis. These cases, scattered over most of southern and central Texas, indicating livestock producers continue good surveillance over animals for screw-worm infestations. Approximately 14,500,000 sterile flies were released over areas of Texas and New Mexico during this period. (Anim. Dis. Erad. Div.).



Figures - Number of cases reported in infested counties for period February 9 - 15

-·-·-·-·· - Limits of fly drop areas

CATTLE LICE - OKLAHOMA - Contine light on cattle in Pushmataha County area. (Okla. Coop. Sur.). UTAH - Controls applied to 5,000 cattle in Tooele County. (Knowlton, Biggs).

BITING MIDGES (Culicoides spp.) - TEXAS - C. variipennis and C. stonei collected from jack rabbits in Presidio County. (Price).

CAT FLEA (Ctenocephalides felis) - CALIFORNIA - Medium in residence in Fairfield, Solano County. (Cal. Coop. Rpt.).

LONE STAR TICK (Amblyomma americanum) - OKLAHOMA - Occasional individuals reported becoming active on cattle in Pushmataha County (southeast). (Okla. Coop. Sur.).

BROWN DOG TICK (Rhipicephalus sanguineus) - CALIFORNIA - Heavy in residence in Barstow, San Bernardino County. (Cal. Coop. Rpt., Feb. 14).

HOUSEHOLD AND STRUCTURAL INSECTS

ELM LEAF BEETLE (*Galerucella xanthomelaena*) - NORTH CAROLINA - Considerable numbers noted on bedroom wall in Cumberland County home. Det. by D. L. Wray. (Mount, Feb. 14).

BOXELDER BUG (*Leptocoris trivittatus*) - PENNSYLVANIA - Has been troublesome about homes in many locations over State during past months. (Pepper, Feb. 15). UTAH - Entering school rooms in Salt Lake City. (Knowlton).

CLOVER MITE (*Bryobia praetiosa*) - NORTH CAROLINA - Large numbers present in Forsyth County home February 11. Det. by D. L. Wray. (Mount).

LEAD-CABLE BORER (*Scobicia declivis*) - CALIFORNIA - This species and *Lyctus cavicollis* extremely heavy in oak pallets in warehouse in Palo Alto, Santa Clara County. (Cal. Coop. Rpt., Feb. 14).

SUBTERRANEAN TERMITES (*Reticulitermes* spp.) - FLORIDA - Winged reproductives of *R. flavipes* flying from nest out-of-doors at Gainesville, Alachua County. (Hetrick, Feb. 15). *R. virginicus* noted in house at Rockledge, Duval County, January 26. Det. by L. A. Hetrick. (Shinkle).

TERMITES - PENNSYLVANIA - Swarming about homes in Lock Haven, Clinton County, and in State College, Centre County. (Gesell, Adams; Feb. 15).

STORED-PRODUCT INSECTS

INDIAN-MEAL MOTH (*Plodia interpunctella*) - CALIFORNIA - Larvae heavy in home-cured prunes in roadhouse in Morgan Hill, Santa Clara County. (Cal. Coop. Rpt.).

Stored-product Insects in Georgia - Light infestations of RICE WEEVIL (*Sitophilus oryzae*), SAW-TOOTHED GRAIN BEETLE (*Oryzaephilus surinamensis*), CONFUSED FLOUR BEETLE (*Tribolium confusum*) and FLAT GRAIN BEETLE (*Cryptolestes pusillus*) present in stored corn and oats in central part of State. (Vanderford).

BENEFICIAL INSECTS

FLOWER FLIES - FLORIDA - *Psilota buccata* collected on Chickasaw plum (*Prunus angustifolia*) at Gainesville, Alachua County, on February 15. (Weems). This is a rarely collected species and this is first specimen for Florida State Collection of Arthropods; last taken in State at same location on February 24, 1919, by P. W. Fatic. (Fla. Coop. Sur.). *Volucella anastacia* taken on bloom of Chickasaw plum at Gainesville, February 16. (Weems). This is first record of this species for Alachua County and fourth specimen in Florida State Collection of Arthropods. Other specimens in collection are 2 from Sebring, Highlands County, and one from Suwannee County. (Fla. Coop. Sur.). *Pipiza femoralis* light in arborvitae (*Thuja* sp.) at St. Petersburg, Pinellas County, February 12. Larvae predaceous on aphids. (Bingaman).

MISCELLANEOUS INSECTS

AN ANT (*Pheidole californica oregonica*) - CALIFORNIA - Heavy locally in yard in Marysville, Yuba County. (Cal. Coop. Rpt.).

AN EARTHWORM MITE (*Fuscuropoda agitans*) - CALIFORNIA - Heavy in earthworm bed in Snelling, Merced County. (Cal. Coop. Rpt.).

CORRECTIONS

CEIR 14(6):78 - MOSQUITOES - FLORIDA - Line 3: Rainfall approximately 14.5 inches, ... should read ... 11.52 inches at municipal airport, ...

CEIR 14(8): HIGHLIGHTS - Reports in this issue are for week ending February 14, unless otherwise indicated.

LIGHT TRAP COLLECTIONS

	Tempera-ture	Precipi-tation	Type of trap *	Agrotis ipsilon (black cutworm)	Carpocapsa pomonella (codling moth)	Chorizagrotis auxiliaris (army cutworm)	Estigmene acrea (salt-marsh caterpillar)	Faronta diffusa (wheat head armyworm)	Feltia subterranea (granulate cutworm)	Heliothis virescens (tobacco budworm)	Heliothis zea (bollworm, corn earworm)	Laphygma frugiperda (fall armyworm)	Loxostege commixtalis (alfalfa webworm)	Loxostege similalis (garden webworm)	Loxostege sticticalis (beet webworm)	Ostrinia nubilalis (European corn borer)	Peridroma saucia (variegated cutworm)	Prodenia ornithogalli (yellow-striped armyworm)	Protoparce quinquemaculata (tomato hornworm)	Protoparce sexta (tobacco hornworm)	Pseudaletia unipuncta (armyworm)	Spodoptera exigua (beet armyworm)	Trichoplusia ni (cabbage looper)	Major crop **
FLORIDA																								
Gainesville 2/18			BL						1												1			
GEORGIA																								
Tifton 2/13-19			BL							0	0								0	0				
SOUTH CAROLINA																								
Charleston 2/10-16			BL	0			0		1	0	0	0					0	0	0	0	1		0	
TEXAS																								
Brownsville 2/13-19			5BL	65			54		210	3	74	74		880			75	71			60		7	

* BL = blacklight; I = incandescent; MV = mercury vapor ; O = other

** alf. = alfalfa; beet = garden beet and/or sugar beet; cole = cole crops (crucifers); cott. = cotton; FC = field corn; grain = small grains; leg. = legumes (unspecified); lett. = lettuce; pean. = peanut; pepp. = pepper; pot. = potatoes; SC = sweet corn; sol. = solanaceous plants (unspecified); soy. = soybean; TC = truck crops (unspecified or mixed); tob. = tobacco; tom. = tomato

SUMMARY OF INSECT CONDITIONS IN THE UNITED STATES - 1963

(continued from page 104)

CEREAL AND FORAGE INSECTS (continued)

SMALL GRAIN INSECTS

Highlights:

GREENBUG, ENGLISH GRAIN APHID, APPLE GRAIN APHID and CORN LEAF APHID were not a problem generally on small grains during 1963. Localized infestations of one species or another did require some treatments during the year in portions of Texas, Colorado and Washington. Three specimens of RICE DELPHACID were found in Palm Beach County, Florida; the first in that State since 1957. No other infestations of this planthopper were found in 1963. Some treatments were applied to control ARMYWORM in Indiana and Illinois, but the insect was of no major importance. ARMY CUTWORM controls were required during March in areas of western Oklahoma, and the pest caused considerable damage to early planted wheat in western Kansas where insecticides were applied to over 750,000 acres with variable results. CUTWORM outbreaks were observed in localized areas of south central and central South Dakota, and FALL ARMYWORM caused heavy damage to small grains in eastern Texas. CEREAL LEAF BEETLE was found for the first time in Ohio, and considerable spread was recorded in Michigan and Indiana. The potential HESSIAN FLY problem did not develop in Kansas primarily because of the extremely dry conditions at the time of spring oviposition. A BROWN WHEAT MITE problem was also anticipated in Oklahoma and Colorado, but due to prevailing conditions, no great problem developed. However, heavy populations did cause considerable damage in southern Nevada, and some controls were necessary in Wyoming, California and Oregon. A condition favorable for WHEAT CURL MITE and wheat streak mosaic appeared to be present last fall in northeastern Colorado. The latter mite was collected for the first time in Arkansas during 1963.

CORN LEAF APHID (Rhopalosiphum maidis) was present in varying numbers on small grains in the coastal bend and northern areas of TEXAS, and moderately heavy infestations were a problem on barley both during the spring and fall in southern NEW MEXICO. The aphid was generally light in OKLAHOMA, with periodic locally heavy populations on small grains throughout the growing season. It was present on winter barley in northeastern COLORADO at light to moderate levels. Oats, barley and wheat in Butte County, CALIFORNIA, were infested where yellow dwarf was extremely heavy. Populations in NEVADA were lower than in 1962 and equal to those of 1961. Infestations of this species were found on wheat and barley seedlings in Ingham and Berrien Counties, MICHIGAN, in late September and early October and it severely infested barley in Middlesex and Nottoway Counties, VIRGINIA, in late November.

GREENBUG (Schizaphis graminum) required controls in a few fields of small grain in northwest and north central TEXAS; and light, spotted infestations were found in wheat during the spring and fall months in Curry, Roosevelt and Quay Counties, NEW MEXICO. Populations in OKLAHOMA were noneconomic to light in most areas during the 1963 cropping season. Infestation levels and control measures were down from the light levels of 1962. The highest populations were present in January, but severe cold weather reduced populations considerably and they remained low the remainder of the season except in a few isolated areas. The first fall activity in Oklahoma was noted during late October, with some buildup in isolated areas of Payne and Logan Counties, central area. Extremely cold and icy conditions in December reduced these populations considerably. In COLORADO, greenbug was found on wheat in trace numbers in eastern and southeastern areas, but due to drought it did not increase to a damaging population. Light to moderate greenbug populations were present on wheat planted in the fall of 1963 in Weld and Larimer Counties, and trace numbers were present on barley during the spring in the eastern area of Colorado. The only infestation of greenbug found in WYOMING was in Park County where it attacked small grains, but damage was light. In general, populations were much smaller than in 1962 in Wyoming. In NEBRASKA, very light and scattered populations of greenbug, averaging 2-10 per 10 sweeps, were found on small grains in the eastern area. The aphid was found for the fifth straight year in MINNESOTA, being first collected in early May. However, populations remained generally low and were not considered a problem. Greenbug appeared early in WISCONSIN; April 17. Populations remained low throughout the season and "red leaf" was essentially absent. The aphid became a problem in parts of Oconto, Marinette, Shawano and Outagamie Counties in mid-June. In ILLINOIS, greenbug was found in wheat and oats in most districts by late June. No apparent damage was done. The highest population recorded was 5 per sweep. Greenbug continued scarce in KANSAS with little damage reported, and it was very light in ARKANSAS. Light to heavy populations were noted on oats in northern LOUISIANA in March; approximately 25 percent plant destruction noted in one Webster Parish field.

ENGLISH GRAIN APHID (Macrosiphum avenae) counts were 30 to 40 per head on wheat in Adams County, WASHINGTON, in early July, and some treating was done. Infestations in NEVADA were above the 1962 level, especially in Humboldt, Pershing and White Pine Counties where medium infestations were present. No insecticide treatments were necessary since infestations were reduced by predators. English grain aphid was the most common aphid in small grains during 1963 in OKLAHOMA, but populations were generally light. The highest counts were found in the south central area during mid-March. Populations declined and activity had ceased by mid-May. Fall infestations in Oklahoma became active in mid-October, about 30 days earlier than the previous 5-year period. Populations of English grain aphid were low in KANSAS, NEBRASKA and MINNESOTA. In NORTH DAKOTA, this species showed considerable buildup on volunteer grain in the northeast during late October and early November. It appeared early in WISCONSIN (April 17), but populations remained low throughout the season.

APPLE GRAIN APHID (Rhopalosiphum fitchii) was unusually heavy in cereal grains and grasses in CALIFORNIA. These infestations were frequently accompained by yellow dwarf disease in barley. Trace to heavy populations were noted in Butte, Solano, Fresno, Sacramento and San Luis Obispo Counties. Counts in WASHINGTON ranged 0-30 per plant on fall-planted wheat and on late oats in Yakima County in October. Apple grain aphid caused 3 percent loss to spring wheat in western COLORADO, and populations were present in numbers that could have caused considerable loss to barley in the western area if controls had not been applied. Winter barley planted in the fall of 1963 in Weld and Larimer Counties, Colorado, has been infested with light to moderate numbers and some fields show symptoms of a virus disease being present. Apple grain aphid populations were low throughout OKLAHOMA during 1963, with the highest populations present in Jackson County during mid-April. Infestations disappeared with the onset of warm weather. Fall activity was first noted in mid-October, but remained at low levels. In ALASKA, a similar species of aphid, Rhopalosiphum padi, was found in large numbers in Palmer and other areas on one of its host plants, Prunus padus. R. padi is one of the more effective vectors of barley yellow dwarf in Alaska.

Greenbug, English grain aphid and apple grain aphid were first reported in SOUTH DAKOTA around May 1 in the southeastern region of the State. The first collection was of alates. A weekly survey was taken at 5 locations throughout the eastern half of South Dakota. Populations of these aphids stayed at non-economic levels throughout the State for the duration of the growing season. Various species of APHIDS were observed on small grains in MISSOURI; and they were prevalent on barley early in the season in Santa Barbara, Alameda, Solano, Fresno and Nevada Counties, CALIFORNIA. Aphids were found on cereals in greater populations in the Tanana Valley of ALASKA than in other areas of the State. English grain aphid and greenbug were below normal in UTAH, but corn leaf aphid was about normal for the year on barley.

Three RICE DELPHACID (Sogata orizicola) specimens were found on June 18, 1963, in rice plantings in Palm Beach County, FLORIDA, and subsequently, hoja blanca disease was found in one location. This was the first time the disease had been found in the United States since 1959 and was in the same general area where the infection occurred in 1957. Neither hoja blanca nor the vector, S. orizicola, was found during 1963 in LOUISIANA. Rice delphacid was last found in Louisiana in 1962 when it was recorded in 7 parishes on 34 properties with 5,335 acres involved. Surveys in ARKANSAS, MISSISSIPPI, SOUTH CAROLINA and TEXAS were negative in 1963.

CHINCH BUG (Blissus leucopterus) adults averaged 7 per 10 sweeps on wheat in Dodge and Saunders Counties, NEBRASKA, in mid-April; and the pest was observed feeding on small grains in MISSOURI during the year. Populations in ILLINOIS were a little higher than in 1962 on small grains.

RICE STINK BUG (Oebalus pugnax pugnax) was general but light on small grains throughout ARKANSAS in May. A few nymphs were found June 22. Surveys were conducted by the sweep method prior to heading of rice. After heading, bugs on rice heads were counted. One commercial scout surveyed 18 fields weekly from late June through late September. This species is closely associated with species of barnyardgrass as the primary alternate host prior to rice forming heads.

A GRASS BUG (Irbisia brachycerus) caused trace amounts of damage to wheat in Dolores and La Plata Counties, COLORADO, and another GRASS BUG (I. pacificus) caused economic damage to wheat and native grasses in the Klamath Falls area of OREGON.

SIX-SPOTTED LEAFHOPPER (Macrosteles fascifrons) was very abundant on oats in ILLINOIS and was also found on wheat. In late June, one field of oats in the northeast district had 18 nymphs and 40 adults per sweep. High numbers were found in MINNESOTA early in May. It was feared that aster yellows, a virus disease, was being carried by the migrating leafhoppers. This was not the case. Plant pathologists at the University of Minnesota found a very small percentage carrying the virus. Aster yellows was unimportant in Minnesota in 1963. The disease was found in Kittson and Marshall Counties, but infection seldom reached higher than 5 percent. Feeding damage by the leafhopper did occur in some fields of small grains. Populations remained high the entire season in Minnesota. Six-spotted leafhopper was present in moderate numbers in NORTH DAKOTA except for a few instances of considerable buildup in flax in the southeast. Unspecified LEAFHOPPERS were found on cereals in greater numbers in the Tanana Valley of ALASKA than in other areas of the State.

ARMYWORM (Pseudaletia unipuncta) infestations were generally spotty during the spring in MARYLAND, with moderate to heavy damage observed locally to barley. The first adults were collected in blacklight trap in Sussex County, DELAWARE, on April 17. Adults were collected regularly in blacklight traps in NEW HAMPSHIRE from July 8th until November 18th, with peak numbers occurring in the last week of July. No outbreaks were reported during 1963 in NEW JERSEY. Infestations were reported in approximately 20 western OHIO counties indicating some loss in wheat by stem cutting and defoliation. Armyworm was also damaging in localized parts of central and northern INDIANA, and controls were applied in the northwest. In ILLINOIS, populations reached as high as 11 larvae per linear foot of row in lodged grain in some fields, and treatments were necessary. An estimited 245,547 acres were treated, including some grassy corn fields. Flights in WISCONSIN again began about the first of April and peaked during the last week of May. Larvae became noticeable in Dane and Columbia County crops, but damage was insignificant. A second moth peak occurred near the end of July, but no known larval damage occurred to crops. In MISSOURI, the first larvae of the season were reported from the southeast April 20. A few larval counts in the southeast ran as high as 36 per square yard, but were confined to dense and down barley and wheat. Populations throughout the rest of Missouri were again low and very little damage occurred. Armyworm was of minor importance in TENNESSEE. Approximately 1,600 acres required treatment, principally in small grains. This saved an estimated $40,000, figuring small grains at $25.00 per acre.

ARMY CUTWORM (Chorizagrotis auxiliaris) caused heavy, local damage to wheat in Ochiltree and Swisher Counties, TEXAS, during 1963. It became active in mid-January in OKLAHOMA and built up to damaging proportions in the northwest and panhandle counties in late January. Cold weather in February reduced activity, but the pest increased again to damaging proportions by early March. Control measures were necessary during March in northwest and panhandle counties but, by early April, most activity has ceased. In KANSAS, army cutworm caused considerable damage to early planted wheat in the western area. Although counts were lower (2-5 per linear foot of row) than what is generally considered to be economic, the cutworm, coupled with winterkill and low soil moisture, kept the plants from making new growth and, as a consequence, as much as 50 percent of the wheat was not harvested in some counties. Insecticides were applied to over 750,000 acres with variable results. The problem area was in a band between Reno and Finney Counties and extended from southern Kansas to as far north as Russell County. In COLORADO, army cutworm was present in economic numbers on wheat only in a relatively small area of Kiowa County. Other areas of Colorado had only trace numbers which were not of economic importance. Grain fields in Umatilla County, OREGON, received damage from this species from April to July; and army cutworm was about normal for the year in UTAH.

DINGY CUTWORM (Feltia ducens) was abundant, but noneconomic, in many wheat fields in Lincoln County, NEBRASKA, in early May; and localized, early spring infestations of unspecified CUTWORMS caused up to 25 percent of winter wheat plants to be destroyed in south central and central SOUTH DAKOTA.

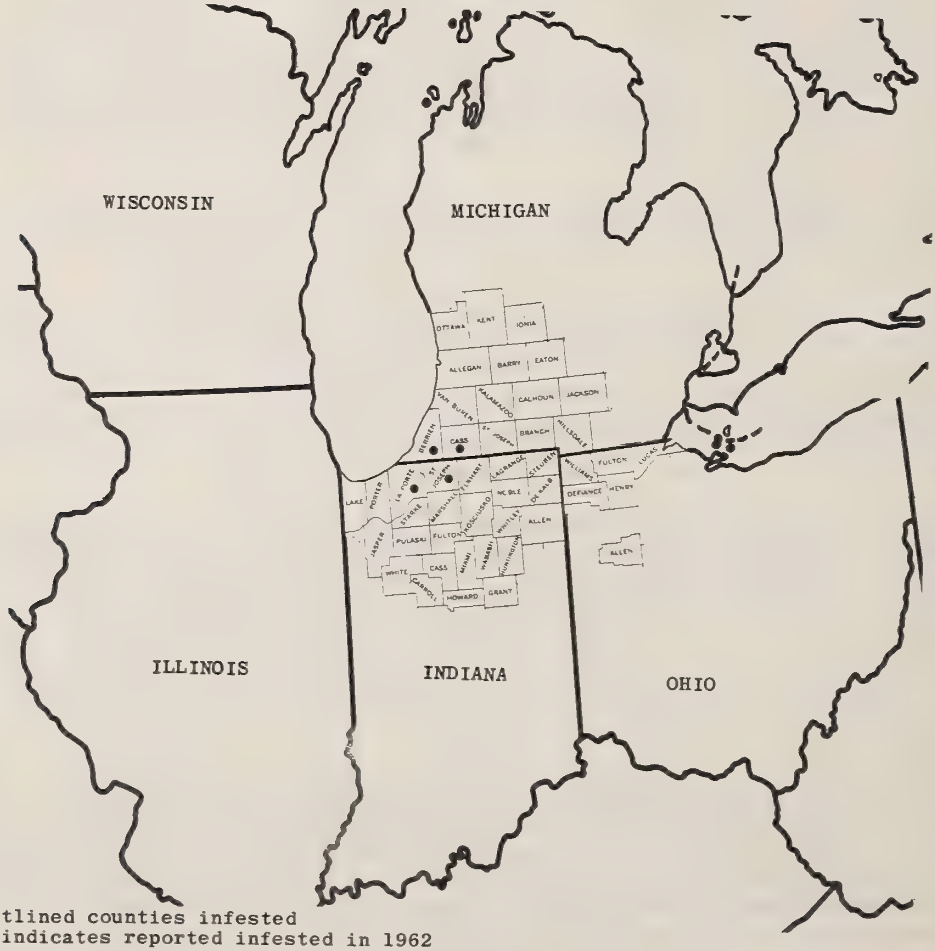
FALL ARMYWORM (Laphygma frugiperda) began building up during late August and reached a peak during early November in TEXAS. It caused heavy damage to small grains in the eastern part of the State. In OKLAHOMA, fall armyworm became active in mid-August in grain sorghum and threatened some small grain plantings in the panhandle and central areas during September. It caused minor damage to wheat in a few southwestern KANSAS counties in the fall, and infestations and damage to cereal crops were severe in southern NEVADA.

STALK BORER (Papaipema nebris) was common in marginal rows of small grains in many areas of ILLINOIS. A count in one field of oats showed 30 percent of the stems infested in the first 10 feet bordering a weedy roadside which had recently been mowed. Many of the infested stems were breaking and dying and the kernels never matured. Wheat was infested in MINNESOTA. Many of the white heads of wheat in that State were caused by this insect rather than by wheat stem maggot (Meromyza americana). WHEAT HEAD ARMYWORM (Faronta diffusa) was not of economic importance during 1963 in KANSAS, but heavy numbers were present in the Joliet area of MONTANA.

CEREAL LEAF BEETLE (Oulema melanopa) was collected May 28 and June 3, 1963, in northwestern Williams County, OHIO. These were the first records for that State. The second collection consisted of two adults and four larvae in four different oat fields. A new quarantine followed, imposing 14 counties located west and north of Hardin County. Latest distribution records indicate 6 Ohio counties infested; namely Williams, Fulton, Lucas, Defiance, Henry and Allen. Populations did not reach economic levels in Ohio during 1963. A total of 25 counties were known to be infested in INDIANA by the end of the year. Only two counties, La Porte and St. Joseph, were found infested in 1962. First 1963 egg hatch was observed on May 2. Of special interest was the report that a second generation developed from larvae collected from a field at New Carlisle, St.

Joseph County, Indiana. Larvae completed development and pupated in June. Emerging adults fed continuously on oats, mated and commenced laying eggs without diapause. The first hatch occurred on August 7. In MICHIGAN, 13 new counties were found infested in 1963. Only 2 counties, Berrien and Cass, were known to be infested before last spring. Populations were considered relatively small in Michigan in all but the primary infestation areas of Berrien and Cass Counties. All new "finds" were made during May and June when larvae and "summer" adults could be surveyed for most easily. Since no new infestations were uncovered after July 1 when most "summer" adults enter an inactive period, it is uncertain just when the major spread discovered in Michigan and the neighboring State of Indiana occurred. Possibly, much of it could have taken place in 1962 and earlier years and went undetected at low infestation levels until adequate survey conditions and personnel combined in 1963. To suppress population and minimize spread, a joint Federal-State control program was initiated early in the spring in the two-state area of Michigan and Indiana. Intensive surveys will be continued in 1964 to determine any further spread of the beetle. Detection surveys in other States during 1963 were negative.

DISTRIBUTION OF CEREAL LEAF BEETLE



Outlined counties infested
• indicates reported infested in 1962

Prepared in Survey and Detection Operations
Plant Pest Control Division
Agricultural Research Service, USDA

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Larval injury by BILLBUGS (Sphenophorus spp.) was evident on wheat plants in some southern MICHIGAN counties in June, and undetermined billbugs were reported on grains in Flathead County, MONTANA, during 1963.

A severe HESSIAN FLY (Phytophaga destructor) problem in the fall of 1962 in KANSAS failed to continue in the spring of 1963 due primarily to extremely dry conditions at the time of spring oviposition. Fall surveys in 1963 showed only a relatively small area in the north central part of Kansas having a serious problem. This was due to a combination of low moisture at oviposition, planting of resistant varieties and some later planting dates. In NEBRASKA, light to moderate infestations occurred in wheat in southwest, south, southeast and eastern areas through June. Counts heaviest in southern counties along Kansas border. Fall surveys showed scattered infestations of 1 to 60 percent in Nebraska. Hessian fly was present over a wide area in the Broadview country of MONTANA, but numbers were not reported as being economic. A heavy infestation was observed in McLean County, NORTH DAKOTA, but only light infestations occurred on wheat in the Red River Valley of MINNESOTA. Populations in ILLINOIS were the lowest since 1958. A summer survey showed an average of 2.8 percent of the tillers infested, with only 4.7 puparia per 100 tillers. A survey of fall-seeded wheat in the east-southeast district of Illinois showed only 0.3 percent of the plants infested, with 1 larva per infested plant. In MISSOURI, a total of 38 fields in 5 counties in the northwest, northeast and southwest areas was checked after harvest for infestations in the stubble. The results showed an average of 1.82 percent of the plants infested with 2.22 puparia per 100 plants. The same number of fields in the same areas was checked in the fall for infestations in fall-seeded wheat and the results showed an average of 10.32 percent of the plants infested with 33.01 larvae per 100 plants.

WHEAT STEM MAGGOT (Meromyza americana) was more prevalent during 1963 in the southern half of MINNESOTA. Infestations ranged generally from 1 to 10 percent. Occasionally a field had as high as 20 percent. The pest caused some concern in the extreme southeast portion of NORTH DAKOTA; and Edmunds County, SOUTH DAKOTA, wheat had stand losses ranging from 10 to 30 percent due to this insect. In NEBRASKA, infestations of less than one percent were present in wheat in all areas of the State. Wheat stem maggot was not of economic importance in KANSAS. Larval specimens were collected from wheat in Wilbarger County, TEXAS, but the infestation was of a light, local nature. A WESTERN WHEAT STEM MAGGOT (Hylemya cerealis) caused trace amounts of injury to wheat in Weld County, COLORADO; and medium to heavy infestations of a RICE LEAF MINER (Hydrellia griseola) developed in May in rice-growing counties of CALIFORNIA.

A WHEAT STEM SAWFLY (Cephus cinctus) survey was conducted in the northwest district of NORTH DAKOTA in mid-July; 33 percent of the dissected stems were infested by larvae. A statewide survey showed a range of 0.0 percent cut stems in most eastern counties to 12 percent cut stems in Billings County. Counties in the northwest district had from 4 to 9.1 percent (averaged 5.8 percent) cut stems. The latter survey was conducted during late summer and early fall. WHEAT JOINTWORM (Harmolita tritici) was not of economic importance during 1963 in KANSAS, and populations were below average in UTAH.

Undetermined THRIPS were a problem on wheat in some areas of COLORADO, primarily due to the fact that their normal host plants dried up and the thrips migrated and damaged wheat, particularly the spring-planted crop. Unidentified thrips were present on barley in the Plentywood area of MONTANA, and a BARLEY THRIPS (Limothrips denticornis) was abundant on small grains in the eastern parts of NORTH DAKOTA. Several species of thrips were very abundant in the heads of barley and wheat in MARYLAND, and they were more abundant than usual on wheat in ILLINOIS.

BROWN WHEAT MITE (Petrobia latens) threatened to build up to damaging numbers during early March in OKLAHOMA, but heavy rains in April reduced this threat and only isolated sections in the central and panhandle areas showed any damage. Some controls were initiated. Brown wheat mite was present on wheat early in the spring in southeastern and eastern COLORADO at population levels which in most years would develop into an economic problem, but due to prevailing conditions, no measurable loss resulted. The mite was also active on barley early in the spring in all areas of eastern Colorado. In WYOMING, heavy infestations of brown wheat mite were found in the wheat-growing areas of Goshen County. Slight damage was noted and controls were applied in some cases. Populations were higher than those found in 1962. Populations were below normal in UTAH and were generally light in central and northern NEVADA, but infestations and damage were medium to heavy on small grains in areas of Clark, Lincoln and Nye Counties, Nevada, in April and May. Brown wheat mite caused light to medium damage to grain fields in the Tulelake area of Siskiyou County, CALIFORNIA, and, in the Klamath Falls area of OREGON, 250 acres of barley and wheat had to be treated to control this mite.

WHEAT CURL MITE (Aceria tulipae) was collected in northwest ARKANSAS in July; a new record for the State. The species was present only in low numbers in KANSAS and only a trace of damage occurred to the harvested crop. Moderate populations were present in wheat in southwest Kimball County, NEBRASKA. This area had large sections of volunteer wheat during the fall of 1962. In the fall of 1962, conditions prevailed in COLORADO which were favorable for development of this mite and wheat streak mosaic in the northeastern area and, as a consequence, caused a reduction in yield of 5 percent on one-third of the planted acreage. A similar situation appeared to be developing in the fall of 1963 and there may be an increase in the amount of loss in 1964.

WINTER GRAIN MITE (Penthaleus major) required controls on small grains in Falls and Comal Counties, TEXAS, and was present in wheat-growing areas of OKLAHOMA from late January to late March. It was observed on small grains in MISSOURI, and below normal for the year in UTAH.

CORN, SORGHUM, MILLET AND SUGARCANE INSECTS

Highlights:

The EUROPEAN CORN BORER increased this past year in several of the more important corn-producing States of the Midwest. As a consequence, damage was greater, even though record corn yields were reported. The fall abundance survey indicated that population levels of overwintering larvae were increased in parts of Iowa, North Dakota, Nebraska, Minnesota and Illinois, but rather low levels were recorded from Indiana eastward. SOUTHWESTERN CORN BORER extended its range eastward in 1963, being recorded for the first time in southern Illinois and in a number of Tennessee and Alabama counties. Damage to corn was decreased this past year in Missouri and Arkansas. CORN EARWORM was generally not important this past year in the more northern States, but heavy damage to corn and/or sorghum was encountered in parts of Arizona, Nevada, Texas, Oklahoma and several Southeastern States. A FALL ARMYWORM outbreak in eastern Texas caused heavy damage to grain sorghum foliage and corn ears. Local outbreaks were also recorded in several other widely dispersed areas. CORN ROOTWORMS continued to be a major problem in a number of Midwestern States. Resistance to several chlorinated hydrocarbon insecticides by WESTERN CORN ROOTWORM was reported in Kansas, Nebraska and South Dakota, and the pest continued to spread in Minnesota, Iowa and Missouri. Damage was recorded in Minnesota for the first time in 1963, and the pest was regarded as being of major importance in the western one-third of Iowa. Infestations of western corn rootworm in Colorado and Wyoming were not as severe as in the past. NORTHERN CORN ROOTWORM caused some damage to corn in parts of Minnesota, Wisconsin, Illinois and Ohio, but losses were not great. Some resistance was reported in Iowa.

WIREWORMS were of importance in a number of States in 1963, and replanting was necessary in a number of instances. CORN LEAF APHID became heavy on corn over the northeastern quadrant of the country, particularly during the droughty periods. Controls were necessary in some instances. Some heavy infestations were also reported in New Mexico and Wyoming. SORGHUM MIDGE caused light to heavy losses to late-planted grain sorghum in areas of New Mexico and Texas, and was heavy on milo in Kings County, California. Populations in Arizona were generally small and very scattered. SPIDER MITES were heavy on corn in areas of Nevada and New Mexico, and they required controls in a number of Colorado counties. BANKS GRASS MITE caused some injury in Nebraska, with moderate infestations being found as far east as Colfax County.

The EUROPEAN CORN BORER (Ostrinia nubilalis) fall survey in southeast NORTH DAKOTA showed considerable increases in larval populations. The survey covered the 5 extreme southeast counties, and showed 95.31 percent of corn plants infested, 3.99 larvae per infested plant and 391.49 borers per 100 plants. Most sweet corn was heavily infested during the year. In SOUTH DAKOTA, the winter mortality survey was started on March 25. The results indicated that mortality of larvae was 10.5 percent in the corn-growing areas of the State. Pupation was 85-90 percent completed by June 1 in the southeast. The June egg mass survey revealed 1-16 egg masses per 25 plants throughout the eastern area in corn fields. The fall infestation survey was completed by November 15, and data showed an average of 39.1 percent of the plants infested compared with 39.6 in 1962 and 106.9 borers per 100 plants compared with 160.3 in 1962. The greatest number of borers per 100 plants was in the southeast district where 259.7 borers were found compared with 293.9 in 1962. The three major parasites of European corn borer in South Dakota as determined by the Corn Borer Investigations Laboratory located at Ankeny, Iowa, are Sympiesis viridula, Horogenes punctorius and Macrocentrus gifuensis. The degree of parasitism was highest in Brookings County, with 21 percent of the borers infested. The overall average for South Dakota was 2.9 percent. Spring European corn borer surveys in NEBRASKA indicated overwintering larval populations were higher than normal. The first generation was light to moderate and spotted in June and July. The second generation built up to high numbers in most areas of the State. Peak moth flights were June 10 and 15, and August 1. Fall surveys indicated a State average of 73 percent infesteation in 1963 compared with 67 percent in 1962 and 38 percent in 1961. Borers per 100 plants were 206 in 1963 compared with 201 in 1962 and 56 in 1961.

European corn borer remained at about the same level as in 1962 in KANSAS, with only the north central area having any appreciable increase in numbers (10 fold). Surveys conducted during all months in NEW MEXICO showed no European corn borer to be present in Curry, Roosevelt, Quay, Lea, Chaves, Dona Ana, Sandoval, Bernalillo, Luna and Otero Counties. The pest is not known to exist in New Mexico. Based on all samples, the numbers of larvae entering hibernation in ARKANSAS averaged 14.1 per 100 plants compared with 24.9 in 1962. Percent stalk infestation averaged 26.7 compared with 36.7 in 1962. The average number of larvae entering hibernation was 180.3 per acre. Lower infestations in 1963 in Arkansas resulted from a lower percentage of corn being planted in June and July. European corn borer was more abundant in TENNESSEE than in 1962. Survival surveys made in early April in southeast MISSOURI showed 53.3 percent reduction of overwintering larvae. Stalk dissections in early May showed 50 percent pupation in the southeast. The first pupa was found in the west central area on May 2, which was slightly earlier than normal for this area. First-brood damage was generally light throughout the State. Second-brood populations in Missouri were higher than in 1962 in the northwest. The highest populations were again in the southeast. Results of the fall abundance survey in Missouri revealed that the average larval population for the State (borers per

100 plants) was about the same as in 1962.

The annual spring mortality survey for European corn borer in IOWA showed the average percent survival to be 76. The first pupa was found in Boone County on May 1, and the first egg hatch occurred on June 6. By the third week of June, leaf feeding became apparent enough to justify serious warning to farmers. The annual first-brood survey was made July 10-12. Of 90 fields examined, 23.2 percent were infested with an average of 1.2 borers per infested plant. The State average was 34 borers per 100 plants. The northwest was generally the most heavily infested area with the infestation apparently spotty in the remainder of Iowa. The fall second-generation survey revealed borers to average 160 per 100 plants, with 71.6 percent of the plants infested. The figures for the 1963 fall survey were about the average for the preceding years. The northwestern part of the State was rather hard hit in 1963 and it appears that damage will be even higher in 1964. The European corn borer population in general was much higher than in 1962.

Mortality of European corn borer averaged 17 percent when the spring survey was made in MINNEOSTA. The extremely cold winter and light snow cover had little effect on the overwintering population. Pupation and moth emergence began during the first week of June in that State. The first-generation population was high in the west central and southwestern districts. Second-generation moth flights began about July 23 and reached a peak during the week of August 19-23. A long, warm fall allowed most of the second generation to complete growth and go into the winter in good condition. Stalk breakage was high in 1963, especially in the west central district where infestations were high. Percent stalk breakage by districts in Minnesota was 13 in the southwest, 17 in south central, 11 in southeast, 23 in west central, 8 in central, 4 in east central and 10 in northwest. An abundance survey in early October showed a population increase in all districts of Minneosta except in the northwest. The State average was 90 borers per 100 plants. The greatest increase was in the south central district. This can be attributed mainly to the second generation. In WISCONSIN, pupation of European corn borer began on May 14. The first adults appeared in mid-May, and flights were larger than in many years previous. Eggs were noted on corn during the second week of June. Treatment was underway by the third week of July in one area. The succeeding generation of moths was less numerous than in 1962, although the overwintering larval population was somewhat greater than in 1962.

European corn borer survival over the previous winter in ILLINOIS was about 66.6 percent. The first-generation survey showed that populations in the northeast, east, central and west-southwest districts remained about the same as in 1962. However, populations in the west and northwest districts were about twice as high as they were in 1962, and the highest they have been since 1958. Borers collected during the first-generation survey in the west and northwest districts of Illinois showed 32 percent were infected by Nosema pyraustae. Practically all first-generation borers pupated. The fall survey showed that the State average for 36 counties increased from 101 borers per 100 plants in 1962 to 106 in 1963. The northwest district increased from 150 to 207, and the northeast district from 64 to 116. The west district remained approximately the same - 149 to 150 borers per 100 plants. All other districts showed decreases in population. No signs of the parasitic tachina fly (Lydella grisescens) were observed during the fall survey. This parasite is rapidly dying out in most districts of Illinois. In INDIANA, first instars appeared on early corn in Vermillion County the second week of June. The annual fall survey revealed an average of 35.7 borers per 100 plants, with 27.8 percent of the plants infested. Eighty-two percent of the fields were attacked in 1963. The loss was estimated at 1.1 percent compared with 0.8 percent in 1962.

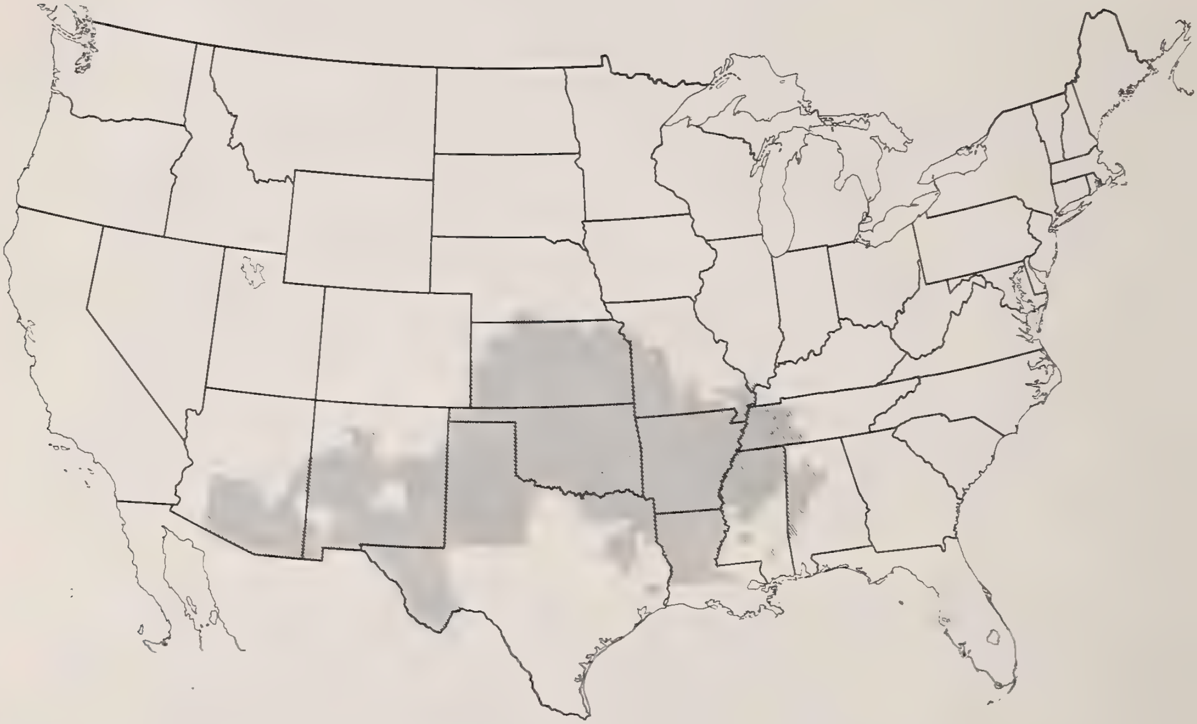
An autumn European corn borer survey in MICHIGAN revealed a lower incidence of larval injury than during 1962 to field corn. Borers averaged 0.28 per stalk on a statewide basis in 1963 and 0.5 per stalk on a similar basis in 1962. County infestations ran from a high of 0.59 per stalk in Lenawee County, a southern county, to 0.0 in the more northern counties of Gratiot, Isabella, Saginaw and Tuscola in 1963. Commercial sweet corn growers in southeast Michigan experienced difficulty controlling the first brood of larvae. Ear damage was generally more severe than any year since 1955. In OHIO, results of the autumn survey indicate lower borer populations than in 1962. The 1963 State average was 20.1 borers per 100 plants (based on all samples collected) compared with 26.3 borers per 100 plants in 1962. Ohio farmers in general are not concerned about European corn borer causing economic losses to field corn. European corn borer was less abundant than in 1962 in PENNSYLVANIA.

The overall European corn borer infestation increased 2 percent during 1963 in VERMONT. It was only moderately abundant generally in NEW HAMPSHIRE and inconspicuous in RHODE ISLAND. Moderate populations and damage were noted on sweet corn in MAINE at Orono, Penobscot County, and Monmouth, Kennebec County, in early August. Light damage to corn was in the Auburn area, Androscoggin County, about the same time. Populations in NEW JERSEY remained at a very low level during 1963. A spot check of field corn in the southern area during the flight of first-brood moths revealed that eggs numbered only 1-4 per 100 plants. Populations were very low on sweet corn in New Jersey. In DELAWARE, the spring larval population of 31 borers per 100 plants was considerably lower than that found in the spring of 1962 and indicated an average reduction of 55 percent in borers that survived the winter. First pupation was noted in eastern Kent County on April 3 and, by April 29, approximately 50 percent of the borers had pupated. First adults of the season emerged on May 5 in outdoor cages in New Castle County, and on May 7, the first female was collected in a blacklight trap in Sussex County. The fall population of borers in corn averaged 77 per 100 plants and closely resembled the relatively low infestations that were found in most areas of the State in 1962. The first-generation larval infestation generally ranged from light to moderate in MARYLAND except in corn planted before May 1 where infestations of from 10 to 50 percent of the plants were common. Moth activity reached a seasonal peak during the last two weeks of July. Light infestations were detected in early July on the Eastern Shore of VIRGINIA, and infestations were light to heavy in GEORGIA. European corn borer has not been a serious pest of corn in Georgia, but it is becoming more so each year. In ALABAMA, European corn borer was present and caused some damage to corn in the upper central and northern counties, but the pest was serious on grain sorghum in two counties, Autauga and Lauderdale. Grain production was reduced 50 to 60 percent in one large field of grain sorghum in Autauga County.

SOUTHWESTERN CORN BORER (Zeadiatraea grandiosella) was collected for the first time in ILLINOIS in Alexander County on March 29, 1963. Subsequent surveys revealed its presence in Pulaski County. Populations were very low. In MISSOURI, the percentage of stalks girdled was considerably lower in the southwest area in 1963. This was probably due to dry weather. Late corn was again severely damaged in the southeast part of Missouri. Several fields were 100 percent infested during the fall survey. The percentage of stalks girdled in late corn in the southeast was up from 20.9 in 1962 to 25.3 in 1963. Two larvae of southwestern corn borer were collected in Wayne County during the year, constituting a new county record. Infestations in ARKANSAS were lighter in the northern area than they were in past years. This was likely due to low winter survival in the colder area of the State and a severe winter. Bird feeding is also reducing overwintering larvae. Winter survival was 14.11 percent in 1963 compared with 22.58 percent in 1962. Survival was only 0.25 percent in the northwest area. Lodged corn was less in 1963 than in any of the four years that these counts have been made, with an average of only 2.2 percent. This was due to low numbers of insects in the northern area and the low acreage of late corn. Southwestern corn borer infestations were general over northern LOUISIANA during the late summer, being heavy on some late-planted corn. It spread considerably in TENNESSEE during the year, being found as far east as Lawrence County. The borer is now present in 21 counties west of the Tennessee River in the State and Lawrence, Wayne, Perry and Humphreys Counties east of the river.

Early infestations in Tennessee were very light but normal infestations existed at the end of the season. The southwestern corn borer entered ALABAMA in one western county in 1962 and spread into a total of 16 counties in 1963, traveling generally in a southeastern direction. Serious damage did not occur in 1963, partly because only the second and third generations were prevalent. More serious damage may occur in 1964 since the pest will be firmly established. One field observed in 1963 showed about an 8 to 10 percent stalk lodging from girdling during the last generation and would have represented quite a loss with machine harvesting. The insect remained at very low levels in KANSAS. In NEW MEXICO, it was present in corn roots or stalks in most fields checked in Curry, Roosevelt, Quay, Lea, Chaves, Dona Ana, Sandoval, Bernalillo, Luna and Otero Counties.

DISTRIBUTION OF SOUTHWESTERN CORN BORER



LESSER CORNSTALK BORER (Elasmopalpus lignosellus) caused light damage to corn in a few south central VIRGINIA fields, and it reached damaging levels on broomcorn and sorghum in OKLAHOMA. The borer caused severe damage to sorghum in Maricopa County, ARIZONA, where replanting was necessary, and it caused considerable damage in other areas of the State. Medium, local infestations were also noted on corn in Orange County, CALIFORNIA. In FLORIDA, small localized infestations of lesser cornstalk borer occurred in the Everglades area on sugarcane, but in spots this species caused loss of approximately one-half the stand. The pest also caused some damage to corn in ALABAMA.

SOUTHERN CORNSTALK BORER (Diatraea crambidoides) numbers ranged from light to moderate in field corn in the three lower Eastern Shore counties of MARYLAND; and the pest caused some damage to corn in upper central and northern counties of ALABAMA.

SUGARCANE BORER (*Diatraea saccharalis*) infestations were heavy in Brazoria County, TEXAS, grain sorghum, but were generally light in other areas of the State. In FLORIDA, sugarcane borer tended to increase in newer plantings of sugarcane located progressively away from Lake Okeechobee.

STALK BORER (*Papaipema nebris*) populations were higher during 1963 in MINNESOTA, especially in the southern third of the State. Marginal rows of corn were infested; counts varied greatly between fields, but infestations did reach as high as 95 percent in marginal rows in Watonwan County. The pest was common in marginal rows of corn in many areas of ILLINOIS, and quite common on sweet corn in PENNSYLVANIA. Larvae conspicuously infested whorls of marginal rows of several fields of field corn in Frederick and Worcester Counties, MARYLAND. In MAINE, light populations and damage to sweet corn were noted in the Springvale area of York County during late July and in Cumberland County in early August.

The heaviest CORN EARWORM (*Heliothis zea*) winterkill on record in WASHINGTON occurred in 1963 because of February runoff flooding the lowlands plus the effects of freeze and thaw. Infestations were light until late in the season, with lowest total light trap catch in the Yakima Valley in seven seasons. Population peaks were recorded in mid-July, late August, mid-September and mid-October, with greatest populations and damage in the late summer and fall. Pupae were numerous this past fall in the Yakima Valley, the heaviest recorded. Corn earworm was light to medium on corn and milo in CALIFORNIA. Corn grown in most areas of ARIZONA was damaged heavily, while sorghum received only moderate damage during the late summer months. Populations and damage were severe in southern NEVADA. Damage to ears of sweet corn was heavy in Clark, Eureka, Lincoln and Nye Counties, but was the lowest in several years in southern Washoe County. The pest was below average in numbers or importance during 1963 in UTAH.

Corn earworm infestations in TEXAS were heavy in grain sorghum heads in south central, north central, northwestern and south plains areas. Damage by corn earworm to field and sweet corn was general in Texas and caused the usual significant damage to untreated fields. The pest was light to heavy in whorls of corn in southern LOUISIANA during May. In OKLAHOMA, heavy populations damaged grain sorghum and corn during late June. Damage to field corn and sorghum continued to be low in KANSAS, but the pest was severe all during the season on sweet corn in the Sedgwick County area. No infestations occurred in early sweet corn in northeast Kansas, but larvae were almost 100 percent in corn harvested late in September. Corn earworm was again light during 1963 in MISSOURI in both whorls and ears of corn. In NEBRASKA, larval infestations ranged from 5 to 80 percent in corn. An unusually early occurrence of 5 adults was noted in the light trap in Lincoln (Lancaster County) March 28 and 29. Populations were extremely low on field corn in MINNESOTA. Moths were caught as early as mid-June in WISCONSIN although significant numbers did not begin appearing until about the fourth week of July. Adults resulting from overwintering larvae were noted at the end of June. Infestation of corn appeared to be minimal, and large flights commenced about mid-September, reached a peak mid-October and fairly large numbers prevailed until the end of October.

Corn earworm injury to field corn was extremely low in MICHIGAN. Of 5 fields selected at random from 18 counties, only 6 ears of a 2,440-ear sample showed earworm injury. Blacklight trap data show a very light flight of adults occurred in Michigan during the season. Most of this took place after silking for the vast majority of field and sweet corn acreage. Most of the sweet corn producers employed a reduced spray program in 1963 with excellent results. Populations in OHIO were quite low throughout the season until late autumn, and the pest was less abundant than the previous year in PENNSYLVANIA. Infestations of sweet corn in the Hudson Valley of NEW YORK were scarce in 1963. Corn earworm remained at a very low level on field corn in NEW JERSEY during 1963, and the pest was at its lowest point in memory on sweet corn. In DELAWARE, the first adults of the season were collected in a blacklight trap in Sussex County on May 22, and young larvae were noted on corn and alfalfa during the week of June 17. Larval infestations were high on corn during August; and adults, as indicated by blacklight trap collections, were extremely abundant during late August and early September in Sussex County, with counts averaging over 150 per night during this period. Ear infestation in field and sweet corn in MARYLAND was about normal, being heaviest in late August and September. Corn earworm infested corn throughout VIRGINIA, but damage was less than in recent years. Untreated sweet corn was 100 percent infested on the Eastern Shore of Virginia by late August. Infestations were rather light in the latter area in early July.

In GEORGIA, light to heavy infestations of CORN EARWORM (Heliothis zea) and FALL ARMYWORM (Laphygma frugiperda) were noted in whorls and heads of grain sorghum and millet. These two species were also moderate to heavy in whorls of field corn in late May and early June. Infestations were general over the State. The corn earworm was abundant early in the season at Sanford, Zellwood and Gainesville, FLORIDA, but as the main sweet corn acreage developed the available earworm population appeared to be spread thin. Thus, farther along in the season, the earworm gave the impression of being lighter, even to the point of being lighter than in 1962, in the Gainesville area at least. In the Everglades areas around Belle Glade, caterpillars were severe on sweet corn the whole growing season. Among these were the corn earworm and fall armyworm, with the latter probably being the worse during the late spring and early fall.

Corn earworm was by far the most serious pest of grain sorghum in ALABAMA. About the third, fourth and fifth generations of this insect attacked grain sorghum that was planted in June and July. Grain in many fields was a 50-percent loss, and in all cases, damage resulted in numerous stored grain pests entering grain heads before the crop was moved into storage after harvesting. When heavy populations of corn earworm and fall armyworm attacked grain sorghum prior to grain heads emerging, serious damage to the stalks occurred and no grain heads developed. Corn earworm did its normal damage to field corn in Alabama. Although the loss of grain from this pest was not too serious, infested ears were quickly entered by numerous damaging stored grain pests, as with grain sorghum, and much damage resulted. Fifty to 100 percent of the ears in fields were attacked by corn earworm, with heaviest infestations appearing in the central and southern counties. Controls for corn earworm on corn planted for grain are not considered economical in Alabama.

FALL ARMYWORM (Laphygma frugiperda) began building up during late August in TEXAS and reached a peak during early November. Heavy damage to grain sorghum foliage and corn ears was commonly reported from the eastern half of the State. About 200 acres southeast of Mora, NEW MEXICO, was sprayed to control this pest; and some sorghum fields were badly damaged in ARIZONA. Fall armyworm was a serious pest of corn and other grasses during 1962 in ALABAMA, but appeared as isolated and heavy in localized areas only in 1963. This pest has been quite unpredictable since it made an early appearance in 1963 in Alabama, and if succeeding generations had developed, as in 1962, it could have been a major pest of corn, pasture and grass-hay crops. The pest was light in ARKANSAS; however, fourth-stage larvae were found on corn as early as June 1 in the southeast. The insect was found feeding on corn in MISSOURI and caused only minor damage to ears of corn in KANSAS. From 1 to 15 percent of corn ears were infested in Lincoln County, NEBRASKA, in September. Larvae were commonly found in corn stalks in eastern and southeastern Nebraska in early November. Larvae were noticeably "ragging" corn in Columbia and Dane Counties, WISCONSIN, in early August, but none were found during the European corn borer survey in September. In MARYLAND, the first infestation of the season occurred in late-planted corn in the central area during the last week of July. Subsequent infestations in late corn in all sections were generally spotty, but some fields had over 50 percent of the plants infested. Fall armyworm occurred as local infestations on corn in August and September in a few central VIRGINIA counties, and several commercial fields of late-planted sweet and field corn were rather severely injured in late July and early August in DELAWARE. Two fields of field corn in Gloucester County, NEW JERSEY, were found to be heavily infested. Populations were generally higher on field and sweet corn in New Jersey than in 1962. In RHODE ISLAND, armyworms, thought to be fall armyworm, caused approximately 1,000 dollars damage to a cornfield in Hopkinton, Washington County, in August.

ARMYWORM (Pseudaletia unipuncta) infestations were generally spotty over MARYLAND in the spring, with moderate to heavy damage occurring mostly to sweet corn and barley in local areas. During early August, larvae damaged Sudan grass and pearl millet in Worcester County. Larval feeding was noted on corn in DELAWARE during mid-June, especially in eastern Kent County. In ILLINOIS, there were some reports of treatments being necessary in grassy corn fields in late July and early August. Small larvae were found moving into corn from fencerows in many sections of IOWA during the second week of June; and light to moderate, spotted armyworm infestations caused damage to lower portions of corn plants in NEBRASKA in August. SOUTHERN ARMYWORM (Prodenia eridania) was heavy locally on corn in Mitchell County, GEORGIA. BEET ARMYWORM (Spodoptera exigua) was collected during the early spring consistently on corn at Iona and Estero on the lower west coast area of FLORIDA, starting earlier in the year than normal.

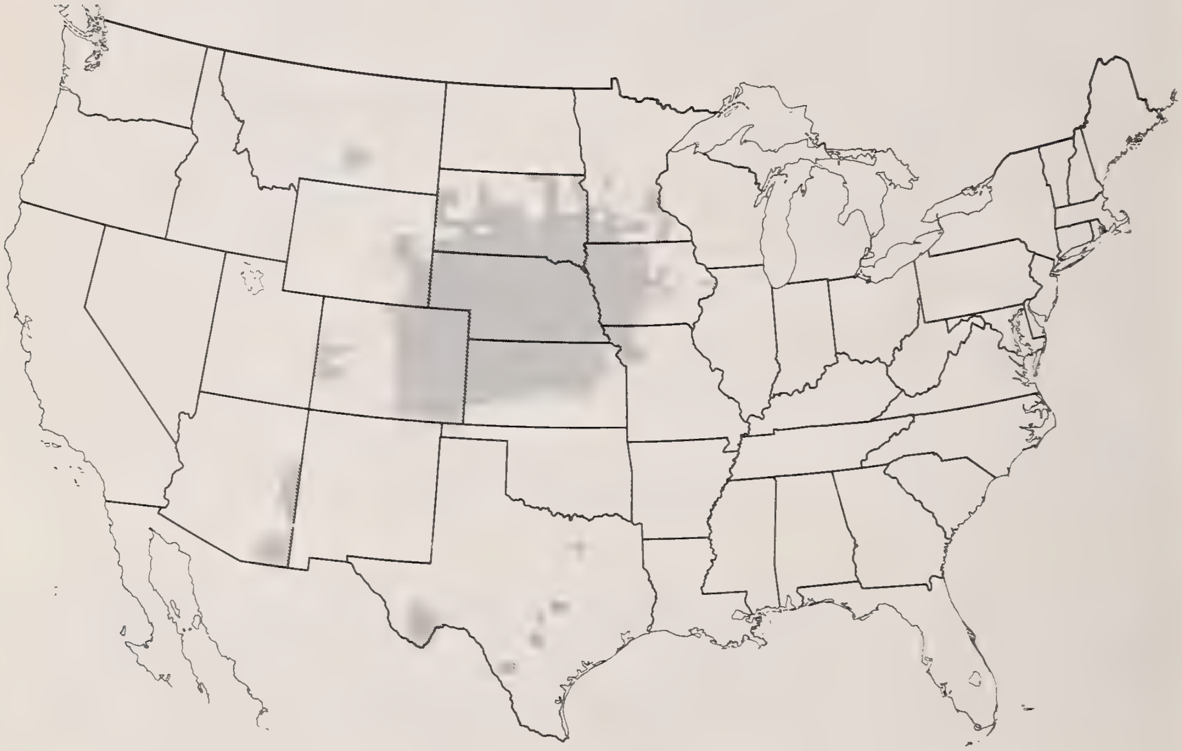
BLACK CUTWORM (Agrotis ipsilon) and VARIEGATED CUTWORM (Peridroma saucia) were responsible for much replanting of corn on the Eastern Shore and in central counties of MARYLAND. Losses were most prevalent in fields following sod. Unspecified CUTWORMS were moderately abundant in NEW HAMPSHIRE with one noticeable outbreak of black cutworm occurring in Merrimack County which caused damage to corn. In PENNSYLVANIA, corn planted on grass sod in the central area was severely damaged soon after it was up by A. gladiaria. Black cutworm damaged corn plants in all districts of ILLINOIS. An estimated 153,029 acres were replanted and 171,045 acres were treated after the corn emerged. In MISSOURI, black cutworm and DINGY CUTWORM (Feltia subgothica) damaged corn in a few scattered fields throughout the State. Overall damage by these cutworms was lighter than in the past few years. Black cutworm caused minor damage to corn in parts of east and central NEBRASKA, with extensive damage occurring to one field of corn in Otoe County in June. Also in Nebraska, WESTERN BEAN CUTWORM (Loxagrotis albicosta) was very low on corn in Dundy and Lincoln Counties in August and September. Black cutworm caused severe damage to corn seedlings in Brazos County, TEXAS, and various species of cutworms were prevalent on sweet corn in CALIFORNIA.

SALT-MARSH CATERPILLAR (Estigmene acrea) severely damaged corn in Waller, Harris and De Witt Counties, TEXAS. CORN ROOT WEBWORM (Crambus caliginosellus) caused light damage to corn in a few fields in the south central part of VIRGINIA. SORGHUM WEBWORM (Celama sorghiella) was light to heavy on heads of millet in GEORGIA; caused some damage to grain sorghum in ALABAMA; generally noneconomic in TEXAS except for a few southern areas where considerable damage resulted; and caused some very light, scattered damage in OKLAHOMA.

CORN ROOTWORMS (Diabrotica spp.), primarily WESTERN CORN ROOTWORM (D. virgifera), continued to be a problem in the north central and northeastern parts of KANSAS. Resistance to some chlorinated hydrocarbon insecticides in western corn rootworm is now extended from Phillips to Nemaha Counties, dropping down into Cloud County. Western corn rootworm, NORTHERN CORN ROOTWORM (D. longicornis), and SOUTHERN CORN ROOTWORM (D. undecimpuncta howardi) were again present in NEBRASKA. Resistance problems moved westward in the panhandle. First larval activity was found in late May and heaviest damage occurred in the southeast and northeast areas. First adult emergence occurred in late June and egg deposition occurred from late July to freezing temperatures. Adult populations were largely western corn rootworm. Southern corn rootworm adults were commonly found in a field of sweetclover in Lancaster County in late November. Some larvae caused damage to winter wheat in Burt County this past fall. In SOUTH DAKOTA, corn rootworms were reported to be causing heavy damage to corn in Yankton County by July 24. The severity of the damage continued to increase as the summer progressed.

Populations during the first week of July for Yankton, Clay and Turner Counties were 20-30 larvae per plant, with an overall development advanced to 80 percent of the population as larvae and the remaining 20 percent as pupae. Mid-July specimens of the western corn rootworm were being sent to the Department of Entomology, South Dakota State University, from as far west as Lawrence County and north as far as Brookings County. Adults of western corn rootworm were collected in the north central and northeast regions of the State by mid-August. As of September 1, 48 of the 65 South Dakota counties were infested with western corn rootworm. Resistance studies were carried out at the Northern Grain Insect Research Laboratory at Brookings. Data showed that this insect had various degrees of resistance to chlorinated hydrocarbon insecticides in the southeast part of South Dakota.

DISTRIBUTION OF WESTERN CORN ROOTWORM



Western corn rootworm was recorded in Greenlee County, ARIZONA, for the first time in 1963. Heavy infestations were found in corn and sorghum. Larvae of this species caused little or no damage to corn in areas of COLORADO where it has been a problem in the past due to the use of control measures being applied at planting time or a better use of crop rotation to reduce losses. Adults were active on the foliage and silks at time of pollination in Yuma County and some controls were applied. In WYOMING, western corn rootworm adult populations were not as severe on corn as in 1962. The first specimens were picked up on August 20 in Platte County where the largest infestations were found; counts averaged 6-8 per corn plant. Larval damage by western corn rootworm in MISSOURI was confined to a few counties in the extreme northwest area. The first adult of the season was observed on June 27. Adults were collected for the first time in the following 7 Missouri counties in 1963: Buchanan, Clinton, Caldwell, Platte, Clay, Ray and Mercer. This brings the total number of counties infested in Missouri to 15. Western corn rootworm was found in 13 MINNESOTA counties for the first time during 1963. There are probably other counties where this insect is present, but no specimens have been collected for positive identification. The following are the counties in which the species has been found: Rock, Pipestone, Nobles, Lincoln, Jackson, Cottonwood, Redwood, Yellow Medicine, Watonwan, Pope, Blue Earth, Waseca, Mower, Olmsted, Goodhue, Dakota and Ramsey. Western corn rootworm has moved rapidly across Minnesota. It was first found in the extreme southwestern corner of the State in 1961 and can now be found on the eastern border counties of Dakota and Goodhue. Damage was also recorded for the first time in 1963. A few fields in Nobles and Rock Counties were severely lodged. Resistance to certain chlorinated hydrocarbon insecticides was indicated in these fields. Western corn rootworm spread further into IOWA in 1963. The western half of the State is now infested. Clinton County, bordering Illinois, is the most eastward spread. Western corn rootworm was first recorded in Mills and Montgomery Counties in 1953 (see CEIR 13(45):1310). Damage by this species was reported to roots of corn in several Iowa counties, and treatments were required in some instances. Western corn rootworm was regarded as being of major importance in the western one-third of the State.

Northern corn rootworm was present again in the southern half of MINNESOTA. Poor control in some fields may be due to light resistance to certain chlorinated hydrocarbon insecticides or to poor application methods. Lodging was present again, especially in the 2 southern tiers of counties. Visual damage was not as apparent generally as in other years. Some resistance has appeared in IOWA (see CEIR 13(45): 1310). Severe damage was reported to corn in Marshall, Jones and Iowa Counties treated with one or the other of two chlorinated hydrocarbon insecticides. Lodging of corn was reported to be as high as 80 percent. Damage to corn by this species in MISSOURI was lighter in 1963 than in 1962. Damage was confined to small, isolated spots in untreated fields. Larvae of northern corn rootworm caused lodging of corn in many ILLINOIS fields by late July and early August. Adults fed heavily on silks in some fields. In WISCONSIN, larvae were becoming full grown in Columbia County by the first week of July and had begun emerging in Richland and Dane Counties on July 17. Severe lodging was reported from portions of Pepin and Rusk Counties and some lodging was evident in Rock and Richland Counties. Although populations were generally high, lodging was minimal due to lack of rainfall and winds following destruction of brace roots. In INDIANA, northern corn rootworm adults fed on corn silks in Greene, Henry and Randolph Counties and caused incomplete filling of ears. Losses in a few localized areas were reported as high as 30 percent. Adults of the insect also fed on kernels and ear tips. Only slight injury was caused by northern corn rootworm in MICHIGAN. Of 90 fields selected at random in October, only three, two in Lapeer County and one in Lenawee County, showed evidence of attack. Yield reduction in these instances was estimated at 10 to 15 percent. Populations of northern corn rootworm are increasing in OHIO with the trend towards a continuous corn program throughout the State. Lodging was not a severe problem in most Ohio fields, but adult damage was widespread and severe in some cases. A few fields yielded 50 bushels per acre less than the previous year.

Southern corn rootworm adults built up some in roadsides adjoining corn fields near Ellendale, NORTH DAKOTA, and plant feeding by this species was present in ILLINOIS, but it caused little actual damage. Southern corn rootworm was responsbile for some damage to corn in ALABAMA.

CORN FLEA BEETLE (Chaetocnema pulicaria) adults were present on corn throughout DELAWARE by mid-May, with most injury occurring during early and mid-July. During May, numbers on young sweet corn were heavy in many fields in Caroline, Montgomery and Queen Annes Counties, MARYLAND. The beetle was almost nonexistent in NEW JERSEY, and scarce in most areas of ILLINOIS. One noteworthy exception in Illinois was in the southwest district on April 29 when counts of 250 per 100 sweeps were found on a field of oats that had noticeable feeding injury. Corn flea beetle was of little concern in KANSAS and some feeding was observed on corn in MISSOURI. Adults of another FLEA BEETLE (Systena frontalis) severely damaged one field of corn in Piatt County, ILLINOIS, by feeding on the leaves of plants. DESERT CORN FLEA BEETLE (Chaetocnema ectypa) was approximately normal in numbers and/or injury in UTAH.

Feeding by adults of BILLBUGS (Sphenophorus spp.) was more noticeable than usual in southern MICHIGAN corn fields in June. In GEORGIA, light to moderate infestations of S. callosus were noted on corn, but most of them were of a light nature. MAIZE BILLBUG (S. maidis) was observed feeding on corn in MISSOURI.

SEED-CORN BEETLE (Agonoderus lecontei) caused heavy damage to a newly planted field of milo in Hitchcock County, NEBRASKA, in mid-May, but was of little economic importance in KANSAS. DUSKY SAP BEETLE (Carpophilus lugubris) adults were first noted this season in DELAWARE during late June and generally abundant on corn by mid-July. Rather high infestations occurred in ears during mid to late August in Sussex County. Sap beetles, especially dusky sap beetle, were common and infested ears and tassels of corn in all areas of MARYLAND. Some infestations were noted in MISSOURI.

JAPANESE BEETLE (Popillia japonica) adults were generally present in MARYLAND, but considerably lighter than in 1962 on corn and soybeans in most sections. BUMBLE FLOWER BEETLE (Euphoria inda) was reported on corn in several parts of MONTANA during the fall. SUGARCANE BEETLE (Euetheola rugiceps) became a pest of early corn in several central ALABAMA counties as has been true in the past in isolated fields. Treatment for this pest and other soil pests has been a standard practice on farms known to have been damaged in prior years.

An unspecified WIREWORM caused 10 percent loss of stands of field corn in Ware and Pierce Counties, GEORGIA. Melanotus communis continued to be abundant in older sugarcane areas of FLORIDA under cultivation. If a new cane field had previously been in sweet corn production, then wireworms were apt to be a problem. M. communis and SOUTHERN POTATO WIREWORM (Conoderus falli) were both a problem on sweet corn at Belle Glade, Florida. Both species were hard to control in that area, and southern potato wireworm in particular was resistant to chlorinated hydrocarbon insecticides. M. communis severely damaged field corn in a number of mountain counties of NORTH CAROLINA during early June. As high as one-third of the plants in a 4-acre field in Clay County was killed and large areas were killed in other fields observed. No soil insecticides had been used in these fields. This species was also present in a Beaufort County, North Carolina, cornfield which was reported to have been heavily damaged during the spring despite the use of recommended material prior to planting. Melanotus spp. caused severe damage to seedling corn in several areas of VIRGINIA in late June. Undetermined wireworms caused heavy damage to a few fields in Allegany and Wicomico Counties, MARYLAND, and serious damage to corn was reported by two county agricultural agents in the central part of NEW JERSEY. Damage to field corn by undetermined wireworms was more prevalent in OHIO than during the past three years. Some fields required replanting. However, there is not a large percentage of cornland infested in Ohio. In ILLINOIS, Aeolus spp. damaged approximately 0.5 percent of the corn plants in the west district, 5.5 percent in the central district and 0.2 percent in the west-southwest district. There were also reports of damage from the northwest district of Illinois. Damage by Melanotus spp. was reported in fields in the southwest and central parts of MISSOURI. More damage by wireworms was evident in the central area of the State in 1963 than in the last five years. Larvae of an unidentified wireworm caused damage to a field of milo in Buffalo County, NEBRASKA.

CORN LEAF APHID (Rhopalosiphum maidis) was reported severe early in the season on sweet corn at Zellwood, FLORIDA; and it became quite heavy in all areas of ALABAMA at times, but damage was difficult to estimate in the latter State. Heavy infestations in Alabama were followed by extreme population buildups of lady beetles, syrphid fly larvae and parasitic hymenopterons. Corn leaf aphid was more of a problem in NEW JERSEY than in 1962 on field and sweet corn. Only a few were found on corn over RHODE ISLAND, but evidence of heavy infestations was noted. Corn leaf aphid became conspicuous on tassels and ear tips of sweet corn at Lomontville, NEW YORK, on July 22. In DELAWARE, very high infestations occurred on some plants in most corn fields throughout the State. The aphid was the heaviest in recent years on field and sweet corn in all sections of MARYLAND. Tassel and leaf infestations of from 10 to 50 percent were widespread and, in many fields, ear development was noticeably retarded. It severely infested several fields of corn in Charles City County, VIRGINIA, in late July. Populations were low in OHIO throughout the season. An October survey in MICHIGAN of corn-growing areas of the Lower Peninsula revealed evidence of general high corn leaf aphid populations which may have caused heavier than normal injury during the droughty periods of 1963.

Corn leaf aphid was first noted on commercial sweet corn in WISCONSIN in Walworth County on July 5. Populations became numerous enough by mid-July to cause whitening of leaves in southwestern Wisconsin counties, and large numbers prevailed in scattered fields in various areas of that State. Populations dropped off by mid-August in Wisconsin, but not before some treatment was applied in eastern counties. Corn leaf aphid was extremely abundant on tassels of most corn in IOWA during mid-July, and it was generally higher than in previous years in SOUTH DAKOTA. Many fields had 100 percent infestations in the latter State, with 20 percent of the tassels being completely covered with honeydew. Numbers were also unusually high on corn in NORTH DAKOTA; and infestations in NEBRASKA were higher than normal in July and August in the eastern half of the State, causing light to moderate damage to corn tassels and milo heads. Corn leaf aphid was noneconomic on corn and sorghum in KANSAS, and present on corn in MISSOURI. The aphid was generally light in OKLAHOMA, with periodic, locally heavy populations present on grain sorghum throughout the growing season. Corn leaf aphid attacked grain sorghum over widely scattered areas of TEXAS, but beneficial insects and other factors usually kept the aphid under control. The pest built up on corn in Torrance County, NEW MEXICO, where a number of growers were forced to treat their fields.

Corn leaf aphid caused little or no damage to corn in COLORADO although colonies were present on 10 percent of the plants in some fields. This species and THRIPS were present on forage and grain sorghum in light to moderate numbers and very little damage resulted. In Baca and Las Animas Counties, Colorado, corn leaf aphid caused some discoloration of broomcorn brushes late in August, but populations were not sufficient to cause any general reduction in the quality of the broomcorn. Corn leaf aphid infestations in WYOMING were higher than in 1962. Heavy infestations occurred in Goshen, Platte and in Washakie Counties. The largest populations occurred during August. In UTAH, corn leaf aphid was below average in numbers or importance during the season on corn. Light to medium infestations were noted on corn in Orange and Fresno Counties, CALIFORNIA; and heavy infestations developed in a number of sweet corn fields in southwestern IDAHO in August.

CORN ROOT APHID (*Anuraphis maidiradicis*) populations in June caused stunting of young corn plants in Madison County, NEBRASKA, and caused some areas of a cornfield to yellow in Dodge County, same State. YELLOW SUGARCANE APHID (*Sipha flava*) infestations were erratic and localized on sugarcane in FLORIDA, but generally on the increase. In MAINE, a very heavy infestation of an unidentified APHID was noted on sweet corn in Eddington, Penobscot County, in late August. Damage was light at that time and no further reports were received.

CHINCH BUG (*Blissus leucopterus*) populations in ILLINOIS were a little higher on corn than in 1962. Treatments were applied to marginal rows of corn in some fields in the central and east districts. The fall survey in Illinois showed a remarkable increase in populations in the central district and in Bond and Clinton Counties. In NEBRASKA, corn was damaged in Colfax County in mid-August. The fall survey in that State revealed scattered populations in the southeast area in October. Populations in KANSAS remained at a low level; only a few sorghum fields in the south central area were damaged. Chinch bug was observed feeding on corn in MISSOURI, and infestations on grain sorghum in TEXAS were similar to those encountered in 1962. Chinch bug was reported to have caused some damage to corn and grain sorghum during 1963 in ALABAMA. Infestations of a CHINCH BUG (Blissus sp.) were unusually abundant on corn in southern LOUISIANA in May; some fields in St. Landry Parish required treatments.

A WEST INDIAN SUGARCANE DELPHACID (Saccharosydne saccharivora) was heavier on sugarcane in FLORIDA during the autumn of 1963 than in either of the two previous years.

SORGHUM MIDGE (Contarinia sorghicola) was heavy on milo in Kings County, CALIFORNIA, late in the season. Infestations were found on sorghum in three ARIZONA counties: Graham, Cochise and Greenlee. Populations were generally small and very scattered. In NEW MEXICO, sorghum midge caused light to heavy losses to late-planted grain sorghum in Lea County; and light to moderate infestations were found on grain sorghum in Curry, Roosevelt and Quay Counties. Growers obtained effective chemical control of sorghum midge in Lea County where treatment was properly timed and applied correctly. Infestations in the high plains of TEXAS warranted control measures over much of the area. The infestation in this area represented a sizable increase over 1962,and late-planted, nontreated grain in the area supported moderate to heavy populations and yield losses were significant. In the south plains area of Texas, infestations of sorghum midge were rather general but less severe than in 1962 due to earlier planting dates and preventive treatments. Infestations were generally less severe in the eastern half of Texas than in 1962 except in late-planted fields where damage was heavy. In ALABAMA, some damage to grain sorghum was reported.

SEED-CORN MAGGOT (Hylemya platura) injury necessitated replanting a few corn fields in Mason and Sanilac Counties, MICHIGAN; and some early planted corn in PENNSYLVANIA were replanted because of damage by this fly. CORN LEAF BLOTCH MINER (Agromyza parvicornis) was present during June on corn throughout all of MISSOURI except the southeast.

Several species of THRIPS were very abundant on young corn in MARYLAND; streaking was noticeable. Silvering was evident on corn in ILLINOIS during July; feeding was observed in MISSOURI; and some damage occurred to corn leaves in Dodge and Saunders Counties, NEBRASKA, in June. Thrips and corn leaf aphid (Rhopalosiphum maidis) were light to moderate on sorghum, but very little damage resulted.

IMPORTED FIRE ANT (Solenopsis saevissima richteri) caused heavy damage to a field of corn in Meriwether County, GEORGIA.

TWO-SPOTTED SPIDER MITE (Tetranychus telarius) was late in starting in CALIFORNIA. Populations were not as severe as in past years in most locations. Light to medium populations were noted on corn in Sacramento County and heavy numbers were found on corn in Santa Clara County. SPIDER MITES began building up on sweet corn seed fields in the southwestern part of IDAHO just as the corn began to tassel. Infestations were heavy on corn in Churchill and Lincoln Counties, NEVADA, in August and early September. In NEW MEXICO, heavy populations of unspecified species dried up foliage of corn which was to be used for ensilage in fields near Dexter, Chaves County, Belen and Los Lunas, Valencia County, and in Torrance County. Spider mites were also a problem on sweet corn in San Juan County, New Mexico, and they infested grain sorghum in Brazos County, TEXAS. Spider mites appeared a month early on corn in all areas of COLORADO and it was necessary for controls to be applied to some fields in Prowers, Bent, Otero, Crowley, Pueblo, Montezuma, Montrose, Delta, Mesa, Larimer, Boulder, Adams, Weld, Morgan, Logan and Sedgwick Counties. In the Arkansas Valley of Colorado, there was some damage to the foliage of grain sorghum, but no damage to heads was noted as they were filled at the time the populations started to build up to damaging levels. Spider mites were common on corn in ILLINOIS, but no damage was observed or reported. BANKS GRASS MITE (Oligonychus pratensis) populations were heavy in Scotts Bluff County, NEBRASKA, and they caused damage to corn.

Moderate damage occurred in Phelps County, same State. Normally, infestations of this mite are in the western half of Nebraska, but generally light to moderate infestations were found as far east as Colfax County.

An undetermined SLUG injured several acres of young corn in Garrett County, MARYLAND, during June.

An estimated 4,049,318 acres were treated to control SOIL INSECTS before corn was planted in ILLINOIS in 1963.

SURVEY OF PARASITES OF THE ALFALFA WEEVIL IN WESTERN MASSACHUSETTS (1)

F. R. Shaw (2) and W. H. Ziener (3)

During surveys and investigations in 1963 on the biology of the alfalfa weevil, Hypera postica (Gyll), several parasites were found.

On August 1, 1963, we discovered a number of parasitized pupae of the alfalfa weevil in the vicinity of Mill River. To our knowledge there had been no release of introduced parasites of the alfalfa weevil within 80 miles of this location. Furthermore, the pupation habits of this parasite did not agree with those of Bathyplectes curculionis (Thoms.) which had been released in Massachusetts in 1962. Bathyplectes larvae spin a cocoon prior to pupation, the present parasite made no cocoon.

Specimens of larvae and adults of the parasite were sent to the U. S. National Museum for identification. They were identified as Itoplectis conquisitor Say by L. M. Walkley. Miss Walkley indicated that this was the first record she had received of parasitism of the alfalfa weevil by Itoplectis conquisitor.

In the fall of 1963, we also found eggs of the alfalfa weevil which had been parasitized. We were able to rear specimens which were identified by Dr. B. D. Burks as Patasson luna (Girault).

We also found a dipterous larva (first instar), which we assumed to be a tachinid,in a pupa of the alfalfa weevil, but were not able to rear this to the adult stage.

In addition to the insects already mentioned, we found adult weevils infected by fungi. These were sent to Dr. E. A. Steinhaus of the University of California. They were examined by G. A. Marsh who reported that two fungi were present. One was Beauveria bassiana which is widespread and pathogenic to many insects. The second, he assigned to the genus Fusarium and indicated that this group usually are secondary saprophytes. He was unable to detect the actual cause of the death of the beetles infected with Fusarium.

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